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**Pore Space as a Resource: A Discussion of the Policy and Regulatory Framework for
Carbon Capture, Utilization and Storage**

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A. ABSTRACT

Reinforced by the International Energy Agency (“**IEA**”), carbon capture, utilization and storage (“**CCUS**”) is currently the only available group of technologies that reduce emissions in key hard to abate sectors and capture carbon dioxide (“**CO₂**”) emissions that enable low carbon value chains such as hydrogen.¹ Further, CCUS and carbon management play a critical role in achieving future global climate and energy goals. In fact, the Intergovernmental Panel on Climate Change (“**IPCC**”) and the IEA state that there is no viable path to net-zero emissions without CCUS and other carbon management technologies.²

Due to concerns regarding energy security and an increase in energy demand, generation of energy from conventional hydrocarbon resources continues to be vital. In Alberta, CCUS is a necessary tool to align provincial climate change goals with the responsible and competitive market of energy production.

Canada’s oil and gas sector has been an early innovator and adopter of CCUS. Given the petroleum and natural gas (“**PNG**”) resources available in the Western Canadian Sedimentary Basin, and the decades-long energy industry expertise established in connection therewith, there is significant potential to further utilize CCUS to create a CCUS-based value chain.

This paper provides an overview of the current Canadian regulatory frameworks enabling CCUS, with a focus on the regulatory framework and development in Alberta (“**Alberta**” or the “**Province**”). Specific topics include: (i) overview of the regulatory frameworks governing CCUS in key jurisdictions in Canada, including Alberta; (ii) overview of the frameworks for the generation of offset credits from environmental attributes associated with a given project or activity, including both federal and provincial carbon credits and clean fuel credits; (iii) a discussion of gaps in policy and legislative; (iv) options for regulating “open access” CCUS hubs and CO₂ pipelines; and (v) overview of the various governmental incentives for CCUS projects, including federal and provincial tax credits.

¹ International Energy Agency, News Release, “The world needs to build on the growing momentum behind carbon capture” (24 September 2020), online: <https://www.iea.org/news/the-world-needs-to-build-on-the-growing-momentum-behind-carbon-capture>.

² Natural Resources Canada, “Carbon Management Strategy (formerly known as the Carbon Capture, Utilization and Storage Strategy)” (24 February 2023), online: <https://natural-resources.canada.ca/climate-change/canadas-green-future/carbon-capture-utilization-and-storage-strategy/23721>.

B. INTRODUCTION

1. What is CCUS?

As described in the *Carbon Storage Atlas*, “[c]arbon capture and storage (“**CCS**”) is the separation and capture of CO₂ from the emissions of industrial processes prior to the release into the atmosphere and storage of the CO₂ in deep underground geologic formations.”³ Examples of capture sources include electricity generators, upgraders, cement plants, ethanol plants, fertilizer plants and oil refineries.⁴

In Canada, oil and gas reservoirs could provide storage capacity for up to 16 gigatonnes (“**GT**”) of CO₂, unmineable coal could provide 4 GT to 8 GT of capacity, and deep saline formations could provide capacity for 28 GT to 296 GT.⁵ Both deep saline aquifers and mature oil and gas reservoirs provide significant CO₂ storage opportunities for Canada. In fact, Canada has an estimated 220 to 1,500 years of available CO₂ storage.⁶

The literature generally identifies four components of any CCUS project: (i) the capture of CO₂ (from an anthropogenic or industrial source); (ii) transportation of CO₂ (typically by pipeline to an injection well); (iii) injection of CO₂ into the storage reservoir; and (iv) post-closure.⁷ However, this paper adds the ongoing measurement, monitoring and verification (“**MMV**”) of the sequestered CO₂ during the life cycle of the CCUS project prior to closure as a fifth component of any CCUS project.

(a) CCUS versus CCS

The terms CCUS and CCS are often used interchangeably. The “utilization” in CCUS refers to the use of captured CO₂ in other industrial activities, such as the production of technical fluid for

³ United States, United States Department of Energy, *Carbon Storage Atlas*, 5 ed (US DOE NETL, 2015) at 6, online (pdf): <<https://www.netl.doe.gov/sites/default/files/2018-10/ATLAS-V-2015.pdf>>.

⁴ Alberta, Alberta Energy, “Carbon Capture & Storage: Summary Report of the Regulatory Framework Assessment” (Edmonton: 1 January 2013) at 33, online: <<https://open.alberta.ca/dataset/5483a064-1ec8-466e-a330-19d2253e5807/resource/ecab392b-4757-4351-a157-9d5aebdec0/download/6259895-2013-carbon-capture-storage-summary-report.pdf>> [**Alberta Energy, “Regulatory Framework Assessment”**].

⁵ NACSA: North American Carbon Storage Atlas, 2011. Canada: Carbon Capture and Storage in Canada, as cited in Robert Wright et al “The First North American Carbon Storage Atlas” (2013) Energy Procedia 37 5280 at 5287, online: <https://www.researchgate.net/publication/273193845_The_First_North_American_Carbon_Storage_Atlas>; and Nigel Bankes & Elizabeth Brennan, “Enhanced oil recovery and the geological sequestration of carbon dioxide: Regulation and carbon crediting” (Report prepared for Natural Resources Canada) (2013 unpublished) [**Bankes & Brennan: “EOR: Regulation and carbon crediting”**].

⁶ Wright et al, *supra* note 5 at 5287.

⁷ Nigel Bankes, Jenette Poschwatta & E. Mitchell Shier, “The Legal Framework for Carbon Capture and Storage in Alberta” (2008) 45:3 Alta L Rev 585 at 587 [**Bankes, “The Legal Framework”**].

feedstock for carbon containing chemicals (e.g. permanent sequestration in cement) or its use for enhanced oil recovery (“EOR”) where captured CO₂ is reinjected into a well to augment hydrocarbon recovery. For purposes of this paper, we will use the term CCUS, consistent with Alberta’s Regulatory Framework Assessment, and our discussion will focus on permanent subsurface sequestration and not utilization of captured CO₂.

(b) CCUS versus EOR

EOR is viewed as a means of non-permanent sequestration of CO₂. There are numerous EOR and acid gas disposal schemes currently operating in Alberta and Saskatchewan. While a detailed review of the EOR regulatory framework is outside the scope of this paper, it is important to highlight certain key differences between EOR and CCUS, including, without limitation, the following:

- While both CCUS and EOR inject captured CO₂, the objective of EOR is to enhance hydrocarbon recovery by injecting CO₂ to increase reservoir pressure. With EOR, the injected CO₂ is not permanently sequestered and is released along with the hydrocarbon recovery process.
- Given the associated hydrocarbon recovery with EOR, EOR schemes are not often viewed as a decarbonization process. EOR stakeholders can be criticized regarding the permanency of the sequestration⁸ and for using CO₂ to produce more fossil fuels for combustion, which still results in the emission of CO₂. However, proponents of EOR schemes would point out that extracting otherwise unproducible volumes of hydrocarbons from existing reserves creates value for Alberta and enables future CO₂ permanent sequestration in depleted fields.⁹

⁸ Christophe McGlade, “Can CO₂-EOR really provide carbon negative oil?”, *International Energy Agency* (11 April 2019), online: <<https://www.iea.org/commentaries/can-co2-eor-really-provide-carbon-negative-oil>>; Bruce Robertson & Milad Mousavian, “Carbon Capture to Serve Enhanced Oil Recover: Overpromise and Underperformance: Shute Creek, the World’s Largest CCUS Facility, Consistently Fails to Meet Its Targets” *Institute for Energy Economics and Financial Analysis* (March 2022), online (pdf): <https://ieefa.org/wp-content/uploads/2022/02/Carbon-Capture-to-Serve-Enhanced-Oil-Recovery-Overpromise-and-Underperformance_March-2022.pdf>.

⁹ Sarah Hannis et al, “CO₂ Storage in depleted or depleting oil and gas fields: What can we learn from existing projects?” November 2016, 13th International Conference on Greenhouse Gas Control Technologies, GHGT-13, Lausanne, Switzerland, *Energy Procedia* 114 (2017) 5680-5690.

- In Alberta, while EOR schemes are regulated under existing frameworks for mineral extraction,¹⁰ pore space tenure for CCUS project development is subject to a separate regulatory framework (as set out in Part D) and more recently, a hub model development program.
- Long term liability for EOR schemes rests with the licensee/operator and other working interest participants¹¹ under the applicable regulatory authorizations. Whereas long term liability for CCUS schemes is transferred to the Crown upon closure, thereby relieving the owners and/or operators from post-closure liability exposure.¹²
- Current investment tax credit schemes promoting development of CCUS projects in Canada are not available for the development and operation of EOR schemes.

2. Scope of Paper

This paper is comprised of nine parts. Following the abstract in Part A and the introduction within this Part B, Part C provides a high-level overview of CCUS frameworks across certain jurisdictions in Canada and Part D provides a detailed overview of the regulatory framework for CCUS in Alberta, including the acquisition of pore space tenure, the entering into of evaluation permits and sequestration lease agreements and other key considerations for the development of CCUS in Alberta. Part E outlines the applicable frameworks, regulations and protocols, both provincially and federally, for the generation of carbon and clean fuel credits associated with CCUS. Part F highlights certain policy or legislative gaps that currently exist. Part G of this paper provides an overview of various options for the regulation of open access CCUS hubs and pipelines as required by Alberta's updated regulatory framework. Part H highlights existing government incentives for the development and construction of CCUS projects. Finally, Part I is the conclusion of this paper.

C. FRAMEWORKS ACROSS CANADA

1. Overview Across Canada

Below is a brief overview of the regulatory framework for CCUS development in some key Canadian provinces. Where available, we identify for each province examined: (1) pore space

¹⁰ *Mines and Minerals Act*, RSA 2000, c M-17 [**MMA**]; and the *Oil and Gas Conservation Act*, RSA 2000, c O-6 [**OGCA**].

¹¹ *OGCA*, *supra* note 10, ss 27-31.1.

¹² *MMA*, *supra* note 10, s 121.

ownership; and (2) the regulatory process for a CCUS proponent receiving the necessary pore space tenure. Not every province in Canada has developed a regulatory scheme for CCUS.

(a) British Columbia

British Columbia has developed a comprehensive CCUS regulatory framework. Northeastern British Columbia may have significant CCUS potential due to its depleted gas pools and deep saline formations.¹³ The British Columbia government has codified its CCUS regulatory regime under the Part 14 of the *Petroleum and Natural Gas Act*¹⁴ (“**PNGA**”) administered by the British Columbia Energy Regulator (formerly the BC Oil and Gas Commission).

(i) *Pore Space Ownership*

In the Fall of 2022, the British Columbia government amended the *PNGA* to introduce a vesting provision for underground storage reservoirs. Under section 125.4 of the *PNGA*:

(1) The government has the right to explore for, access, develop and use storage reservoirs for the purpose of storing and disposing of

- (a) carbon dioxide;
- (b) a substance referred to in section 50(2)(b); or
- (c) a prescribed substance.¹⁵

Notably, the entirety of Part 14 of the *PNGA*, including s. 125.4, does not apply in relation to treaty lands of a treaty First Nation, Nisga’a lands including Nisga’a Fee Simple Lands within the meaning of the Nisga’a Final Agreement, the lands over which the Supreme Court of Canada granted a declaration of Aboriginal title¹⁶ and the lands found by the British Columbia Supreme Court¹⁷ to be proven title area outside the claim area.¹⁸

Under section 129.1 of the *PNGA*, a person must not use a storage reservoir to store or dispose of substances described in section 125.4(1), except for in accordance with either a lease under Part 6 or a licence under section 130.¹⁹

¹³ Alf Hartling, “Carbon capture and storage in British Columbia” Geoscience Reports 2008, BC Ministry of Energy, Mines and Petroleum Resources (2008) at 25-31, online (pdf); <https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/natural-gas-oil/ccs/2008_hartling.pdf>.

¹⁴ *Petroleum and Natural Gas Act*, RSBC 1996, c 361 [**PNGA**].

¹⁵ *Ibid*, s 125.4(1).

¹⁶ *Tsilhqot’in Nation v British Columbia*, 2014 SCC 44.

¹⁷ *Tsilhqot’in Nation v. British Columbia*, 2007 BCSC 1700.

¹⁸ *PNGA*, *supra* note 14, s 125.3.

¹⁹ *Ibid*, ss 129.1, 130.

(ii) *Receiving Pore Space Tenure*

The *PNGA* provides three mechanisms in which a party may undertake CCUS activities in the province: (i) under an existing PNG lease (“**PNG Lease**”) granted under section 50²⁰; (ii) through a storage reservoir licence granted under section 130²¹; or (iii) through an exploration licence granted under section 126.²²

Under section 50 of the *PNGA*, a PNG Lease holder may utilize its tenure to store and dispose of natural gas and substances associated with PNG exploration, production or processing.²³ Specifically, the holder of a PNG Lease has the right to store or dispose of natural gas, water produced in relation to the production of PNG or other substances associated with PNG exploration, production or processing into a storage reservoir in the location of the lease.²⁴ Such other substances include CO₂ produced from a well or captured at a PNG facility.

Broader storage rights are provided to holders of storage reservoir licences under section 130 of the *PNGA*. A storage reservoir licence permits a person to store or dispose of CO₂ from any source. However, the class of persons who may apply for a storage reservoir licence is limited. Applications under section 130 are limited to holders of a PNG permit, drilling license, lease, another storage reservoir license or an exploration license.²⁵

Finally, under section 126 of the *PNGA*, if a CCUS project proponent does not yet hold the requisite tenure to apply for a storage reservoir license, or if more information on the geology and engineering properties of a potential underground storage reservoir is needed to support an application, a proponent may apply to the Ministry for an exploration license.²⁶ Similar to Alberta’s framework governing evaluation permits (as discussed further below), the information gathered under an exploration licence will be used in the next steps of applying for a storage reservoir licence.

²⁰ *Ibid*, s 50.

²¹ *Ibid*, s 130

²² *Ibid*, s 126.

²³ *Ibid*, s 50.

²⁴ *Ibid*, s 50(2)(b).

²⁵ *Ibid*, s 130(1).

²⁶ *Ibid*, s 126.

(b) Saskatchewan

In July 2000, the Weyburn-Midale Carbon Dioxide Project launched in Saskatchewan and remains one of the largest CCUS (EOR) initiatives in the world.²⁷ Saskatchewan reported that over the past 25 years its EOR projects have sequestered more than 40 million tonnes of CO₂.²⁸

(i) *Pore Space Ownership*

Currently, there is no legislative statement regarding the ownership of pore spaces in Saskatchewan. However, given proponents of CCUS should apply for ministerial authorization for a CCUS project, the Government of Saskatchewan appears to view pore space resources as property of the provincial Crown. This position is consistent with *The Crown Minerals Act*,²⁹ which confirms that ownership of spaces occupied or formerly occupied by Crown minerals vests with the province.

(ii) *Receiving Pore Space Tenure*

Despite Saskatchewan's historical and continued promotion of CCUS projects, the legislative framework regulating such projects in the province remains minimal. CCUS project approval in Saskatchewan is governed by a discretionary ministerial approval process under *The Oil and Gas Conservation Act*³⁰ ("**OGCA (SK)**"). The following provisions of the OGCA (SK) grant the responsible minister discretionary power to permit CCUS projects:

Powers of minister

17(1) Without limiting the generality of section 6, the minister may make orders, on the minister's own motion or on the application of an interested person:

(k) respecting the containment, storage, handling, transportation, treatment, processing, recovery, reuse, recycling, destruction and disposal of oil and gas waste anywhere in Saskatchewan and non-oil-and-gas substances at a licensed facility or well or associated site; ...

(n) respecting the processing and storing of:

²⁷ Petroleum Technology Resource Centre, "IEA GHG Weyburn CO₂ Monitoring & Storage Project Summary Report 2000-2004" (Paper delivered at the 7th International Conference on Greenhouse Gas Control Technologies, Vancouver, 5-9 September 2004) at 1.

²⁸ Saskatchewan, Ministry of Trade and Export Development, News Release, "Saskatchewan Announces Carbon Capture Utilization and Storage Priorities" (7 September 2021), online: <<https://www.saskatchewan.ca/government/news-and-media/2021/september/07/saskatchewan-announces-carbon-capture-utilization-and-storage-priorities>> [**Saskatchewan, "CCUS Priorities"**].

²⁹ *The Crown Minerals Act*, SS 1984-85-86, c C-50.2, s 27.2

³⁰ *The Oil and Gas Conservation Act*, RSS 1978, c O-2.

...

(iii) non-oil-and-gas substances at a licensed facility or well or associated site.

Accordingly, a CCUS proponent (non-EOR) must complete a storage project application for a CO₂ Storage Project and receive authorization from Saskatchewan's Ministry of Energy and Resources through the Integrated Resource Information System before licensing, recompleting or reclassifying a well associated with a storage project.³¹ This approval process applies to both pilot and full-scale storage projects, as well as modifications and expansions.³²

To apply for a storage project authorization, proponents must already have the right to construct, operate and modify the proposed project wells within a storage project area and obtain any other approvals necessary for construction, if applicable.³³ Furthermore, applicants must provide notice in accordance with *Directive PNG009: Public Notice Requirements*,³⁴ where it is the responsibility of the applicant to identify and notify any potentially or directly affected parties outside of the minimum notification area.

Further requirements for CCUS projects in Saskatchewan are provided by *Directive PNG008: Disposal and Injection Well Requirements*,³⁵ which contains stipulations for completion, operation and monitoring requirements, as well as other logging, measurement and reporting requirements.

In September 2021, the Government of Saskatchewan announced its renewed key CCUS priorities, including:³⁶

- Expanding the province's Oil Infrastructure Investment Program³⁷ ("**OIIP**") to include CO₂ pipeline projects. In November 2021, the Government of Saskatchewan further announced that pipelines transporting CO₂, whether for CCUS or EOR, are eligible for the

³¹ Saskatchewan, "Storage Project Application", online: *Storage Project Application* <<https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/oil-and-gas/oil-and-gas-licensing-operations-and-requirements/oil-and-gas-drilling-and-operations/gas-storage-and-cavern-storage-disposal>>.

³² *Ibid.*

³³ *Ibid.*, s 2.

³⁴ *Directive PNG009: Public Notice Requirements*, Revision 2.0, MRO 41/20 (Saskatchewan Ministry of Energy and Resources, March 2020).

³⁵ *Directive PNG008: Disposal and Injection Well Requirements*, Revision 1.1, MRO 101/18 (Saskatchewan Ministry of Energy and Resources, March 2018).

³⁶ Saskatchewan, "CCUS Priorities", *supra* note 28.

³⁷ See *The Oil Infrastructure Investment Program Regulations*, RRS c F-13.4 Reg 42, s 4 [**OIIP Regulation**].

OIIP tax credit, a transferable production tax credit at a rate of 20% of eligible project costs.³⁸

- Working with industry stakeholders to evaluate the current EOR royalty regime to ensure that CO₂ injection projects remain highly competitive.
- Amending and clarifying regulations to support investment and provide certainty around pore space ownership, access, unitization of high-potential EOR plays and long-term obligations and accountability for CO₂ storage.
- Exploring opportunities for CCUS infrastructure hubs and distribution models, including for the Regina-Moose Jaw Industrial Corridor to Southeast Saskatchewan and Greater Lloydminster areas.
- Advancing the development of a CCUS greenhouse gas (“**GHG**”) credit generation program, recognized under Saskatchewan’s emissions management framework, focused on minimizing administrative burden prior to investment and maximizing credit generation for captured and sequestered CO₂.

(c) Ontario

Ontario is in the process of developing its CCUS regulatory regime. Previously, geologic injection and sequestration of CO₂ was expressly prohibited by section 11(1.1) of the *Oil, Gas and Salt Resources Act*³⁹ (the “**OGSRA**”). However, policy in Ontario has shifted and this prohibition was repealed in March 2023.⁴⁰ The province now plans to create a framework to regulate and enable the permanent geologic storage of carbon through a phased approach that supports the industry and encourages sector innovation, while maintaining public safety and safeguarding the environment.

³⁸ Saskatchewan, Ministry of Energy and Resources, “Oil Infrastructure Program Expanded to Support Carbon Capture” (4 November 2021), online: <<https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/oil-and-gas/oil-and-gas-incentives-crown-royalties-and-taxes/oil-infrastructure-investment-program>>.

³⁹ *Oil, Gas and Salt Resources Act*, RSO 1990, c P 12.

⁴⁰ *Less Red Tape, Stronger Ontario Act, 2023*, SO 2023, c 2.

(i) Pore Space Ownership

In Ontario, pore space storage rights coincide with mineral ownership of the land,⁴¹ and therefore involves a combination of Crown and privately-owned spaces. Private ownership of pore space is more prevalent given that most storage capabilities are located in southern Ontario.⁴² The private ownership regime for pore space has historically been used for natural gas storage.⁴³ Thus, using pore space for CO₂ storage would likely fall under this existing mineral ownership regime.

(ii) *Development of a Pore Space Tenure Regime*

Government of Ontario first considered the development of a CCUS regulatory framework in early 2022.⁴⁴ The Ministry of Northern Development, Mining, Natural Resources and Forestry issued a discussion paper in January 2022, identifying possible sedimentary rock formations around the province where test projects could evaluate CCUS suitability.⁴⁵

On November 23, 2022, the Ontario government announced *Bill 46, Less Red Tape, Stronger Ontario Act, 2023*⁴⁶ (“**Bill 46**”), which received royal assent on March 22, 2023. Bill 46 repeals the prohibition on underground carbon sequestration contained within the *OGSRA*.

The Ontario government has continued to pursue the development of a carbon sequestration regime. Additionally, the Ontario government released its “Roadmap Towards Regulating Geologic Carbon Storage”, which contemplates that throughout 2023, legislative and regulatory changes will be introduced to allow projects to test and demonstrate new activities. Such activities include geological storage. Initially, these tests will occur on private land only, with commercial-scale geological carbon storage projects on Crown and private land expected to be permitted in

⁴¹ See *Application by Union Gas Limited for Natural Gas Storage – Heritage Pool Development* (29 May 2009), EB-2008-0405, online (pdf): <<https://www.rds.oeb.ca/CMWebDrawer/Record/127611/File/document>>.

⁴² Nigel Banks & Julia Gaunce, “Natural Gas Storage Regimes in Canada: A Survey” (December 2009) University of Calgary, Institute for Sustainable Energy, Environment and Economy Working Paper. In Ontario, mineral rights ownership generally passes with land patented to private landowners, see *Public Lands Act*, RSO 1990, c P.43, s 61.

⁴³ *Ibid.*

⁴⁴ Ontario, Ministry of Northern Development, Mines, Natural Resources and Forestry, “Geologic Carbon Storage in Ontario, ERO 019-4470” (11 January 2022), online: <<https://ero.ontario.ca/notice/019-4770>>.

⁴⁵ Ministry of Northern Development, Mining, Natural Resources and Forestry, *Discussion Paper: Geologic Carbon Storage in Ontario* (Government of Ontario: January 2022) at 2, online: <<https://prod-environmental-registry.s3.amazonaws.com/2022-01/Geologic%20Carbon%20Storage%20Discussion%20Paper%20-%20FinalENG%20-%202022-01-04.pdf>>.

⁴⁶ Bill 46, *Less Red Tape, Stronger Ontario Act, 2023*, 1st Sess, 43rd Leg, Ontario, 2022 (assented 22 March 2023), SO 2023, c 2.

summer or fall of 2023.⁴⁷ It is expected that for 2025 and beyond, the government will refine and adapt the framework for emerging technologies and activities.⁴⁸

(d) Newfoundland and Labrador

The development of a CCUS regulatory framework in Newfoundland and Labrador is still in its infancy. Though the on-shore geology of Newfoundland and Labrador does not allow for suitable storage of CO₂ as done by traditional injection, certain off-shore sedimentary basins have the potential for CCUS.⁴⁹

The 2022 Annual Emissions Reduction Initiatives Report⁵⁰ of the Canadian-Newfoundland & Labrador Offshore Petroleum Board (“**C-NLOPB**”) highlighted the work that The Net Zero Project⁵¹ has done to study the potential for the province to implement offshore CCUS technology. In the report, C-NLOPB stated that “Newfoundland and Labrador has an opportunity to be an early front runner in offshore CCUS technology with proper planning and collaboration amongst stakeholders.”⁵²

(i) *Pore Space Ownership*

As storage of CO₂ on ocean basins would occur on federal lands, CO₂ storage would fall under section 8 of the federal *Oceans Act*,⁵³ which clarifies that seabed and sub-seabed ownership is vested in the federal Crown:

8 (1) For greater certainty, in any area of the sea not within a province, the seabed and subsoil below the internal waters of Canada and the territorial sea of Canada are vested in Her Majesty in right of Canada.

⁴⁷ Ontario, “Roadmap Towards Regulating Geologic Carbon Storage” (23 November 2022), online: *Geologic Carbon Storage* <<https://www.ontario.ca/page/geologic-carbon-storage>>.

⁴⁸ *Ibid.*

⁴⁹ The Net Zero Project, “Carbon Capture, Utilization and Storage Offshore Newfoundland and Labrador: A Net Zero Project White Paper” (February 2023) at 32-33, online: <<https://energynl.ca/wp-content/uploads/2023/03/NZP-CCUS-White-paper-Main-Report-Ver-09.pdf>> [**Net Zero Project, “Net Zero White Paper”**].

⁵⁰ Canada-Newfoundland & Labrador Offshore Petroleum Board, *2022 Annual Emissions Reduction Initiatives Report*, (Ottawa: 31 January 2023, Chair: Roger Grimes), online (pdf): <<https://www.cnlopb.ca/wp-content/uploads/emrep/emrep2022.pdf>> [**C-NLOPB, “2022 Emissions Report”**].

⁵¹ The Net Zero Project is a collaborative partnership of EnergyNL, econext and Oil and Gas Corporation of Newfoundland and Labrador.

⁵² C-NLOPB, “2022 Emissions Report”, *supra* note 50 at 23.

⁵³ *Oceans Act*, SC 1996, c 31, s 8.

However, provincially, Newfoundland and Labrador regulates offshore emissions under the *Management of Greenhouse Gas Act*.⁵⁴

(ii) *Developing a Pore Space Tenure Regime*

Developing a regulatory framework for offshore CCUS would involve the unique interplay between both provincial and federal law, as well as a component of international law. A collaborative white paper, *Carbon Capture, Utilization and Storage Offshore Newfoundland and Labrador: A Net Zero Project White Paper* (the “**Net Zero White Paper**”), which was supported by funding from Natural Resources Canada’s Emissions Reduction Fund and the Government of Newfoundland and Labrador, proposes that developing a regulatory framework for offshore CCUS projects should fall under the scope of the existing C-NLOPB. The C-NLOPB is a joint provincial-federal regulatory body that manages the exploration, development and exploitation of petroleum resources offshore Newfoundland and Labrador.⁵⁵

The Net Zero White Paper highlights that because Canada is a party to the London Protocol,⁵⁶ Canada has enacted measures within the *Canadian Environmental Protection Act*⁵⁷ (“**CEPA**”) that prohibit sub-seabed CO₂ storage.⁵⁸ However, the London Protocol was amended in 2006 to allow sub-seabed CO₂ storage and the amendments has come into force, which Canada has adopted.⁵⁹ Thus, Canada could now amend the provisions in CEPA to allow for offshore CCUS and remain compliant with international obligations.

(e) Quebec

The province of Quebec has not developed a CCUS regulatory framework and its current position on such projects is unclear. In 2013, the Government of Quebec financed a preliminary evaluation of the geologic storage potential of its five sedimentary basins in the southern portion of the province.⁶⁰ However, recent legislative developments in Quebec have restricted exploration and

⁵⁴ *Management of Greenhouse Gas Act*, SNL 2016, c M-1.001.

⁵⁵ Net Zero Project, “Net Zero White Paper”, *supra* note 49.

⁵⁶ The London Protocol is one of two global ocean treaties prohibiting the dumping of wastes into the sea, including the storage of wastes or other matters in the seabed, *The 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972*, LC PROT 1996 (amended 2006), online (pdf): <<https://www.epa.gov/sites/default/files/2015-10/documents/lpamended2006.pdf>> [**London Protocol**].

⁵⁷ *Canadian Environmental Protection Act*, SC 1999, c 33 [**CEPA**].

⁵⁸ *London Protocol*, *supra* note 56, Annex 1, s. 1.8.

⁵⁹ International Maritime Organization, *Status of IMO Treaties* (19 April 2023) at 573, online (pdf): <<https://wwwcdn.imo.org/localresources/en/About/Conventions/StatusOfConventions/Status%202023.pdf>>.

⁶⁰ Karine Bédard et al., “CO₂ Geological Storage in the Province of Quebec, Canada – Capacity Evaluation of the St Lawrence Lowlands Basin”, *Energy Procedia* 37 (2013).

development of underground reservoirs and PNG resources.⁶¹ Furthermore, the Government of Quebec has not yet approved any pilot projects to explore the potential for geologic CCUS throughout the province.

(i) *Ownership of Pore Spaces*

In April 2022, the Government of Quebec enacted the *Act Ending Exploration for Petroleum and Underground Reservoirs and Production of Petroleum and Brine* (the “**Act Ending Exploration**”),⁶² is to end the exploration for petroleum and underground reservoirs and production of petroleum and brine within the province.⁶³ Section 4 of the *Act Ending Exploration* vests underground reservoirs as “part of the domain of the State.”⁶⁴

(ii) *Pore Space Tenure Regime*

However, section 10 of the *Act Ending Exploration* provides that permitted under a storage licence within the meaning of the *Act respecting natural gas storage and natural gas and oil pipelines*⁶⁵ are not subject to the overarching licence revocations. Furthermore, sections 43(1) of the *Act Ending Exploration* still makes it possible for CCUS study project to be approved:

43. The Minister may, after consulting with the Minister of Sustainable Development, Environment and Parks, authorize by order published in the *Gazette officielle du Québec* the implementation of a pilot project that involves the use of a well subject to the obligation provided for in section 10.

In a case where an authorization is required under the Environment Quality Act (chapter Q-2), the pilot project may not be authorized before that authorization is issued.

A pilot project must allow the acquiring of geoscientific knowledge related to

(1) carbon dioxide sequestration potential; ...

The Minister determines the standards and obligations applicable within the framework of a pilot project, in particular to ensure the safety of persons and property and the protection of the environment, and to foster the involvement of local communities, which may differ from the standards and obligations provided

⁶¹ *Act ending exploration for petroleum and underground reservoirs and production of petroleum and brine*, CQLR, c R-1.01.

⁶² *Ibid.*

⁶³ *Ibid.*, s 1.

⁶⁴ *Ibid.*, s 4.

⁶⁵ *Act respecting natural gas storage and natural gas and oil pipelines*, CQLR, c S-34.1.

for by this Act or the regulations. The Minister may also determine the provisions of a pilot project whose contravention constitutes an offence.

In September 2021, Questerre Energy Corporation filed an application with the Quebec Ministry of Energy and Natural Resources to test a reservoir for its potential to store CO₂.⁶⁶ This pilot project would be the first of its kind in Quebec. However, at the time of writing, no new developments have been announced on the status of this application.

D. ALBERTA'S CCUS REGULATORY FRAMEWORK

1. Overview

Alberta is a national leader in developing and advancing regulatory framework for CCUS projects. With deep oil and gas industry expertise and abundance of suitable subsurface reservoirs, CCUS in Alberta is seen as a viable and critical tool in Canada's efforts to decarbonize. The following subsections will provide an overview of the CCUS regulatory framework in Alberta, from the acquisition of pore space tenure, evaluation and sequestration phase licenses and agreements, environmental impact assessments and other regulatory permitting considerations, through to closure obligations and long-term liability matters.

There are three main components to the CCUS value chain: (i) the capture and compression of CO₂ emissions; (ii) the transportation of CO₂ to a sequestration site; and (iii) the permanent sequestration of CO₂.⁶⁷ With respect to the third component, the permanent sequestration of CO₂ can be achieved in a depleted reservoir, a deep saline aquifer, an unmineable coal seam,⁶⁸ ocean storage, a salt cavern, mineral carbonization or for use in industrial processes.⁶⁹ Alberta recently prioritized the regulation and development of CCUS within deep saline aquifers. Thus, this paper focuses on the regulatory framework applicable to CCUS in deep saline aquifers.

⁶⁶ Questerre Energy Corporation, News Release, "Questerre Files Application for Carbon Storage Reservoir Test" (24 September 2021).

⁶⁷ Nigel Bankes & Rick Nilson, "Economic Regulation and the Design of a Carbon Infrastructure for Alberta" in Martha M Roggenkamp, ed, et al, *Energy Networks and the Law, Innovative Solutions in Changing Markets* (Oxford University Press, 2012), ch 13 Nigel Bankes & Rick at 231.

⁶⁸ *Ibid* at 232.

⁶⁹ Mazzotti et al, "Mineral carbonization and industrial uses of carbon dioxide" in Intergovernmental Panel on Climate Change, *IPCC Special Report on Carbon Dioxide Capture and Storage* (New York:Cambridge University Press, 2005), ch 7 at 319, online (pdf): <https://www.ipcc.ch/site/assets/uploads/2018/03/srccs_wholereport-1.pdf>.

In 2010, to encourage CCUS projects in Alberta, in 2010 the Province passed the *Carbon Capture and Storage Statutes Amendment Act, 2010*⁷⁰ and the *Carbon Sequestration Tenure Regulation*⁷¹ (“**CS Tenure Regulation**”) were passed to: (i) clarify issues relating to pore space ownership; (ii) put in place a system whereby a CCUS operator can acquire disposal rights; (iii) to provide for the transfer to the Crown of liability for CCUS projects post-closure; and (iv) to deal with certain regulatory matters including the issuance of closure certificates.⁷²

2. Pore Space Tenure

The *Mines and Minerals Act*⁷³ (the “**MMA**”) vests ownership of all pore space within Alberta with the Crown.⁷⁴ Moreover, section 54 of the *MMA* creates a prohibition on injecting any substance into a subsurface reservoir that is the property of the Crown without an authorization or by an agreement in accordance with the *MMA*.⁷⁵ The *MMA* defines “subsurface reservoirs” as “pore space within an underground formation or a subsurface cavern.”⁷⁶ Pore space includes “the pores contained in, occupied by or formerly occupied by minerals or water below the surface of land”⁷⁷ And a “subsurface cavern” is the “subsurface space created as a result of operations for the recovery of a mineral.”⁷⁸

In accordance with Part 9 of the *MMA* and the *CS Tenure Regulation*⁷⁹, in order to inject captured CO₂ into a subsurface reservoir, proponents must apply to the Minister of Energy (the “**Minister**”) for the requisite rights and approvals, including evaluation permits and sequestration lease agreements.⁸⁰

Pursuant to section 15.1(1) of the *MMA*, the Crown’s ownership of pore space is independent of ownership of mineral or PNG storage rights.⁸¹ As noted above, EOR schemes differ in that the

⁷⁰ *Carbon Capture and Storage Statutes Amendment Act, 2010*, SA 2010, c 14.

⁷¹ *Carbon Sequestration Tenure Regulation*, Alta Reg 68/2011 [**CS Tenure Regulation**].

⁷² M. G Massicotte, A. L Ross and C. B Thompson, ‘The Changing Legislation and Regulation of Carbon Capture and Storage: Impacts on Purpose, Policy and Projects’, *Alberta Law Review* (2011) 49:2 [**Massicotte, “The Changing Legislation and Regulation of CCS Projects”**].

⁷³ *MMA*, *supra* note 10.

⁷⁴ *Ibid*, s 15.1.

⁷⁵ *Ibid*, s 54.

⁷⁶ *MMA*, *supra* note 10, s 1(1)(bb)

⁷⁷ *CS Tenure Regulation*, *supra* note 71, s 1(i).

⁷⁸ *MMA*, *supra* note 10, s 1(1)(aa).

⁷⁹ *CS Tenure Regulation*, *supra* note 71.

⁸⁰ *MMA*, *supra* note 10; *Ibid*.

⁸¹ *MMA*, *supra* note 10, s 15.1(1).

rights are based on traditional PNG tenure (whether Crown mineral rights or freehold mineral rights).⁸² The disposition of the rights for use of pore space falls within the administration of Alberta Energy and the Minister of Energy may enter into agreements with respect to the use of the pore space.⁸³ The storage domain contemplated for CO₂ sequestration consists of pore storage contained in, occupied by, or formerly occupied by minerals or water within an underground formation deeper than 1,000 metres below the surface of the allocated land.⁸⁴

For a CCUS scheme, tenure to the pore space is obtained from the Crown pursuant to the *MMA* and the Province's competitive hub proposal process (as discussed further below). Currently in Alberta, pore space tenure is only issued for deep saline aquifers and not mature, depleted oil and gas reservoirs. If permitted in the future, unless otherwise subject to regulatory changes, the pore space tenure regime described below would also apply to permanent sequestration within mature, depleted oil and gas reservoirs (without EOR).

3. Initial Project Permitting Stages

The initial application and permitting period for CCUS projects in Alberta can be divided into four stages:⁸⁵

- (i) selection through the competitive Carbon Sequestration Tenure Management process;
- (ii) initial acquisition of subsurface and surface rights (i.e. evaluation permits and carbon sequestration lease agreements);
- (iii) discretionary activity review and potential Environmental Impact Assessment (“**EIA**”); and
- (iv) regulatory approvals (e.g. Alberta Energy Regulator (“**AER**”) injection scheme and pipeline and injection well licenses).

⁸² *MMA* and *OGCA*, *supra* note 10.

⁸³ *MMA*, *supra* note 10, s 15.1(3).

⁸⁴ *CS Tenure Regulation*, *supra* note 71, s. 1(c).

⁸⁵ Government of Alberta, “Carbon Capture, Utilization and Storage: Developing Storage Hubs to Meet Growing Demand”, online: <<https://www.alberta.ca/assets/documents/energy-fact-sheet-storage-hub-development.pdf>>.

4. Selection of Eligible CCUS Hub Proponents

(a) Carbon Sequestration Tenure Management Process

In the spring of 2021, the Province suspended the issuance of pore space tenure agreements under the *MMA* while it revisited how it will manage CCUS tenure going-forward. On May 12, 2021, the Province announced that it will issue carbon sequestration rights through a competitive process to enable the development of “carbon storage hubs”.⁸⁶ A carbon storage hub is an area of pore space overseen by a company that will plan and facilitate carbon sequestration of captured CO₂ from various emissions sources as a service to multiple industrial clients.⁸⁷

Using the existing CCUS regulatory framework under Part 9 of the *MMA*, Alberta ran two “Request for Full Project Proposal” (the “**RFPP**”) processes as a prerequisite to obtaining the rights to evaluate and inject captured CO₂ into pore space under the *MMA*. The process does not apply to EOR or injection of formation acid gas these projects operate under mineral rights tenure pursuant to Part 4 of the *MMA* and the *Oil and Gas Conservation Act* (the “**OGCA**”).⁸⁸

Alberta Energy implemented the RFPP in phases based on geographical region.⁸⁹ Projects that were eligible to participate in the RFPP process must service and enable the sequestration of CO₂ from more than one facility located within Alberta.⁹⁰ Proponents must provide open access to parties subject to fair and reasonable cost recovery in providing: (i) carbon sequestration services; and (ii) access by a third party to pore space to undertake injection.⁹¹

As set out by the Government of Alberta, the carbon sequestration lease agreements granted to successful proponents under the RFPP process were intended to:⁹²

⁸⁶ Government of Alberta, “Information Letter 2021-19” (12 May 2021), online (pdf): <<https://inform.energy.gov.ab.ca/Documents/Published/IL-2021-19.pdf>>.

⁸⁷ Government of Alberta, “Carbon capture, utilization and storage – Hub development process”, online: *Emission Reduction Programs: Carbon Capture, Utilization and Storage* <<https://www.alberta.ca/carbon-capture-utilization-and-storage-hub-development-process.aspx>> [Alberta, “**Hub Development Process**”].

⁸⁸ *OGCA*, *supra* note 10; and Government of Alberta, “Request for Full Project Proposals for Carbon Sequestration Hubs” (2 December 2021) at 1.1, 1.4, online (pdf): <<https://www.alberta.ca/assets/documents/energy-request-for-full-project-proposals-rfpp-guidelines.pdf>> [Alberta, “**RFPP Guidelines**”].

⁸⁹ *Ibid* at 1.2.

⁹⁰ *Ibid* at Appendix A.

⁹¹ *Ibid*.

⁹² Alberta, “Hub Development Process”, *supra* note 87.

- (i) grant the successful proponent the right to drill wells, conduct evaluation and testing, establish monitoring baselines and inject captured CO₂ into deep subsurface formations within previously defined zones for sequestration; and
- (ii) place requirements on the agreement holder that include:
 - a. managing the development of the hub and the efficient use of the pore space;
 - b. ensuring open access to affordable use of the hub where appropriate; and
 - c. providing just and reasonable cost recovery to the agreement holder.

Within the RFPP Guidelines, the Province made it clear that selection as a successful proponent did not represent a guarantee or certification of the pore space location's suitability for the sequestration.⁹³ Successful proponents must proceed with a suitability evaluation of the pore space area identified (or area of interest) within the proponent's proposal before a sequestration lease agreement is considered.

As of the date of publication, the Province has run two RFPPs and selected a total of 25 successful proponents.⁹⁴ The first RFPP was primarily for CCUS projects enabling sequestration of carbon emissions from the Alberta Industrial Heartland ("**Heartland**") zone near Edmonton.⁹⁵ The second RFPP was held to provide CCUS services across the balance of the Province (outside of the Heartland zone). Successful proponents were invited to enter into an agreement with the Province to further evaluate the identified area of interest.

The Province has communicated within the RFPP Guidelines that it will continue to monitor the sequestration needs of the Province and provide additional opportunities in response to future market demand, including "exploring the potential for other forms of carbon sequestration including the use of mature fields."⁹⁶ It remains to be determined if and to what extent depleted

⁹³ Alberta, "RFPP Guidelines", *supra* note 88, at 1.3.

⁹⁴ Alberta, "Hub Development Process", *supra* note 92.

⁹⁵ Alberta, "RFPP Guidelines", *supra* note 88, at 1.3 (This area includes Sherwood Park, Fort Saskatchewan, Gibbons, Redwater, Bruderheim and Lamont. The designated geographical region for the first RFPP was within the Heartland zone prescribes the boundary for where the emissions must be sourced from but does not prescribe or restrict where a sequestration hub must be located. In other words, CO₂ injection can occur outside of the region designated in the RFPP).

⁹⁶ *Ibid* at 1.1.

oil and gas reservoirs will be considered for permanent sequestration or if EOR will be included as part of the Province's broader framework for CCUS.

(b) The Evaluation Permit and Carbon Sequestration Lease Agreement

The Carbon Sequestration Tenure Management Process facilitates the granting of two specific types of subsurface agreements required to acquire pore space rights to develop a CCUS project:

(i) evaluation permits;⁹⁷ and (ii) sequestration lease agreements.⁹⁸

(i) *Evaluation Permits*

Evaluation permits are agreements with the Government of Alberta that grant a proponent the right to evaluate the geological or geophysical properties of a subsurface reservoir in a specified location to determine its suitability for the sequestration of captured CO₂.⁹⁹

An evaluation permit does not grant the permittee the right to recover any minerals found within the location of the permit.¹⁰⁰ It is intended only to offer the successful proponent the right to conduct diligence and does not guarantee that the proponent will be issued an agreement for sequestration. Instead, proponents must approach the Province for an agreement to sequester CO₂ supported by evidence that the proposed location is suitable.¹⁰¹

The term of an evaluation permit is 5 years and may be renewed at the discretion of the Minister.¹⁰² Under an evaluation permit, the permit holder may (subject to the requirements pursuant to the OGCA¹⁰³ to obtain the requisite well licenses or amendments to well licenses from the AER) drill a new well or may re-enter an existing well for the purpose of assessing the suitability of the applicable reservoir.¹⁰⁴

⁹⁷ MMA, *supra* note 10, s 115.

⁹⁸ *Ibid*, s 116.

⁹⁹ *Ibid*, s 115(1).

¹⁰⁰ CS Tenure Regulation, *supra* note 71, s 3.

¹⁰¹ Alberta, "RFPP Guidelines", *supra* note 88, at Appendix A.

¹⁰² *Ibid*, s 4.

¹⁰³ OGCA, *supra* note 10.

¹⁰⁴ MMA, *supra* note 10, s 115(1).

(ii) *Sequestration Lease Agreements*

Carbon sequestration agreements (or sequestration lease agreements) are agreements with the Government of Alberta, which grant a proponent the right to inject captured CO₂ into a subsurface reservoir for sequestration and to manage carbon storage hubs in Alberta.¹⁰⁵

Prior to the RFPP model, carbon sequestration agreements were issued as a Crown agreement under section 9 of the *MMA*¹⁰⁶ which provides the Minister with discretionary power to enter into a contract with any person or a provincial, territorial or federal government regarding the storage or sequestration of substances in subsurface reservoirs.¹⁰⁷

Sequestration lease agreements will still be issued under section 9 and reflect the existing provisions within Part 9 of the *MMA*, and will also incorporate aspects of the *CS Tenure Regulation*, including:

- (i) the term of a carbon sequestration lease agreement being 15 years with no automatic rights of renewal, but may be renewed for a successive 15-year term subject to conditions prescribed by the Minister at the time;¹⁰⁸
- (ii) MMV planning and reporting, as further described below; and
- (iii) the provision of an initial and updated closure plan.¹⁰⁹

A sequestration lease agreement grants a successful proponent the right to drill wells, conduct evaluation and testing, establish monitoring baselines, and inject captured CO₂ into deep subsurface formations within previously defined zones for sequestration.¹¹⁰ The agreement will also place requirements on the proponent that are consistent with the original stated intention of the RFPP including: (i) the management of the development of the hub and efficient use of the pore space; (ii) ensuring open access to affordable use of the hub where appropriate; and (iii) providing just and reasonable cost recovery to the proponent.¹¹¹

¹⁰⁵ *CS Tenure Regulation*, *supra* note 71, s 9.

¹⁰⁶ Alberta, "RFPP Guidelines", *supra* note 88, at Appendix A.

¹⁰⁷ *MMA*, *supra* note 10, s 9(a)(iii).

¹⁰⁸ *CS Tenure Regulation*, *supra* note 71, s 10.

¹⁰⁹ Alberta, "RFPP Guidelines", *supra* note 88, at Appendix A.

¹¹⁰ *CS Tenure Regulation*, *supra* note 71, s 3.

¹¹¹ Alberta, "Hub Development Process", *supra* note 92.

Notwithstanding section 57 of the *MMA*, these agreements may be entered into and grant storage rights to mineral interest owners.¹¹² Storage rights are defined as “the right to inject fluid mineral substances into a subsurface reservoir for the purpose of storage”¹¹³ and are typically used in the oil and gas industry for natural gas storage. These storage rights are distinct from the right to inject captured CO₂, which is not a substance included within the definition of a mineral under the *MMA*.¹¹⁴ Sequestration lease agreements are not transferable without the written consent of the Minister¹¹⁵ and the Minister may, in his or her discretion, refuse to consent to a transfer of the agreement.¹¹⁶

(iii) *Application for an Evaluation or Sequestration Lease Agreement*

Under the *CS Tenure Regulation*, the procedure for obtaining an evaluation permit and a carbon sequestration lease agreement includes the submission of: (i) an application in a form that is satisfactory to the Minister;¹¹⁷ (ii) the prescribed application fee;¹¹⁸ (iii) the prescribed annual rental for the first year of the term of the evaluation permit; and (iv) a MMV plan.¹¹⁹ Additional requirements in the case of carbon sequestration lease agreements are the submission of: (v) evidence satisfactory to the Minister that the location specified in the application is suitable for the sequestration of captured CO₂; and (vi) a closure plan.¹²⁰ While MMV and closure plans are also required to be submitted to the AER pursuant to recent updates to *Directive 065: Resources*

¹¹² *MMA*, *supra* note 10, s. 116(1).

¹¹³ *Ibid*, s 1(1)(z).

¹¹⁴ *Ibid*, s 1(1)(p) ((p) (“minerals” means all naturally occurring minerals, and without restricting the generality of the foregoing, includes (i) gold, silver, uranium, platinum, pitchblende, radium, precious stones, copper, iron, tin, zinc, asbestos, salts, sulphur, petroleum, oil, asphalt, bituminous sands, oil sands, natural gas, coal, anhydrite, barite, bauxite, bentonite, diatomite, dolomite, epsomite, granite, gypsum, limestone, marble, mica, mirabilite, potash, quartz rock, rock phosphate, sandstone, serpentine, shale, slate, talc, thenardite, trona, volcanic ash, sand, gravel, clay and marl, but (ii) does not include (A) sand and gravel that belong to the owner of the surface of land under section 58 of the Law of Property Act, (B) clay and marl that belong to the owner of the surface of land under section 57 of the Law of Property Act, or (C) peat on the surface of land and peat obtained by stripping off the overburden, excavating from the surface, or otherwise recovered by surface operations;).

¹¹⁵ Under the *MMA*, “Minister” is defined as the Minister determined under section 16 of the *Government Organization Act* as the Minister responsible for the *MMA*.

¹¹⁶ *MMA*, *supra* note 10, s 118(1). Under the *MMA*, “agreement” is defined to specifically exclude other arrangements with the Crown and is limited to the grant of rights in respect of a mineral or subsurface reservoir.

¹¹⁷ *CS Tenure Regulation*, *supra* note 71, s. 3(2)(a), 9(2)(a).

¹¹⁸ See *Mines and Minerals Administration Regulation*, AR 262/97, Schedule.

¹¹⁹ *CS Tenure Regulation*, *supra* note 71, s. 3(2)(b)-(d), 9(2)(b)-(d).

¹²⁰ *Ibid*, s 9(2)(e)-(f).

*Applications for Oil and Gas Reservoirs*¹²¹ (“**Directive 065**”), these currently must be approved by Alberta Energy prior to the proponent commencing injection.¹²²

In the case of evaluation permits, the MMV plan must set out:

- (i) the MMV activities that the permittee will undertake for the term of the permit;
- (ii) an analysis of the likelihood that the operations or activities will interfere with mineral recovery; and
- (iii) any other information requested by the Minister.¹²³

For purposes of a carbon sequestration lease agreement, a closure plan must be submitted for approval as part of the grant of the lease and the lessee must comply with the approved closure plan.¹²⁴ The lessee of an agreement shall monitor all wells and facilities and perform all closure activities in accordance with the applicable regulations.¹²⁵ Following compliance with the closure plan obligations, a lessee of an agreement may apply to the Minister for a closure certificate.¹²⁶ The Minister has discretion to accept an application for a closure certificate if the Minister is satisfied that certain closure criteria have been met. As noted above, there seems to be redundancy in the requirement that closure plans reviewed by the Minister for the purposes of a carbon sequestration lease agreement are also submitted to the AER as part of the licensing process for CO₂ sequestration schemes. At present, a closure plan remains a requirement of the *CS Tenure Regulation*, though, it is possible that this requirement may be removed from the sequestration lease agreement phase in order to be dealt with later by the AER. Should the review and approval of closure plans be delegated to the AER, there could be an increased risk to proponents when entering a sequestration lease agreement without confirmation of an approved closure plan. Further, while the Minister has specified the application requirements for a sequestration lease under the *CS Tenure Regulation*, the form of the agreement itself remains

¹²¹ Alberta Energy Regulator, *Directive 065: Resources Applications for Oil and Gas Reservoirs* (9 April 2021), online (pdf): <<https://static.aer.ca/prd/documents/directives/Directive065.pdf>> [**Directive 065**].

¹²² *Ibid*, s 4.1.7(10).

¹²³ *CS Tenure Regulation*, *supra* note 71, s 7.

¹²⁴ *Ibid*, s 18.

¹²⁵ *MMA*, *supra* note 10, s 119

¹²⁶ *Ibid*, s 120(1)

unclear which place increased risk on proponents when applying for a long term tenure agreement whose specific terms remain subject to development.

Sites deemed appropriate to secure long-term sequestration are selected based on a number of criteria. For a CO₂ geological sequestration site to be technically feasible, three major parameters are essential:

- (i) the sequestration complex must have sufficient capacity to sequester all the volume of CO₂ requested in any application for geological sequestration;
- (ii) injection zones in the sequestration complex must have sufficient injectivity to sequester CO₂ at the required rate (i.e. at the rate supplied by the capture facility); and
- (iii) the sequestration complex must have adequate seals to contain all injected and displaced fluids.¹²⁷

The four main types of geological storage and disposal sites are: (i) depleted oil and gas reservoirs; (ii) deep saline formations; (iii) coal beds; and (iv) salt caverns.¹²⁸ Each geological site has different challenges. As discussed above, under the Province's Carbon Sequestration Tenure Management Process, only subsurface formations deeper than 1,000 meters with no associated hydrocarbon recovery (i.e. injection into a saline aquifer) are currently eligible.¹²⁹ Within the RFPP however, the Province indicated that it will continue to engage with industry to explore the potential for other forms of sequestration including the use of mature oil and gas fields.¹³⁰

For a carbon sequestration lease agreement, in addition to the above requirements, an applicant's MMV plan¹³¹ must include an analysis of the likelihood that the operations or activities will interfere with mineral recovery.¹³² For hub proponents under the RFPP, detailed economic information about the proposed project and insurance details are also required by the Minister in consideration of granting a sequestration lease agreement. This appears to be a new requirement in order to

¹²⁷ Alberta Energy, "Regulatory Framework Assessment", *supra* note 4.

¹²⁸ Bankes, "The Legal Framework", *supra* note 7 at 589.

¹²⁹ Alberta, "RFPP Guidelines", *supra* note 88 at 1.4.

¹³⁰ *Ibid* at 1.1.

¹³¹ OGCA, *supra* note 10, s 15(b).

¹³² This is often referred to as the 'no harm test'.

assess the viability of the proposed hub and creditworthiness of the project entities at the sequestration lease agreement stage.

5. Environmental Impact Assessment

(a) Provincial

Once the subsurface rights agreements (i.e. the pore space tenure rights) have been obtained, a review occurs to determine whether a project requires a provincial EIA pursuant to Part 2 of Alberta's *Environmental Protection and Enhancement Act*¹³³. The AER administers EIAs for energy projects while Alberta Environment and Protected Areas ("**AEPA**") is responsible for all other types of industrial activity.¹³⁴

Proposed projects are either a mandatory activity designated as such by regulation¹³⁵ or a project for which the Director¹³⁶ is of the opinion that the potential environmental impacts warrant further consideration.¹³⁷

CCUS projects are not listed as a mandatory or exempted activity within the *Environmental Assessment (Mandatory and Exempted Activities) Regulation*.¹³⁸ However, an assessment may be triggered through a review of the project as a discretionary activity.¹³⁹ As a result, to determine if an EIA will be required for a CCUS project, proponents must submit a Project Summary Table and a map to the Director.¹⁴⁰ Following receipt of the summary of the proposed project and any

¹³³ *Environmental Protection and Enhancement Act*, RSA 2000, c E-12 [**EPEA**].

¹³⁴ Alberta Government, "Alberta's Environmental Assessment Process" (December 2015), online (pdf): <<https://open.alberta.ca/dataset/25654f70-8686-407b-b683-0a0521ba50d7/resource/2b4f7770-fd7a-499c-a81d-f0ac2fdee8c3/download/environmentalassessmentprocess-dec2015.pdf>>.

¹³⁵ *EPEA*, *supra* note 133, s 39(c).

¹³⁶ Under *EPEA*, "Director" is defined as a person designated as a Director for the purposes of *EPEA* by the Minister. "Minister" is defined as the Minister determined under section 16 of the *Government Organization Act* as the Minister responsible for *EPEA*.

¹³⁷ *EPEA*, *supra* note 133, ss 41 & 43.

¹³⁸ *Environmental Assessment (Mandatory and Exempted Activities) Regulation*, Alta Reg 111/1193.

¹³⁹ *EPEA*, *supra* note 133, ss 41 – 45.

¹⁴⁰ *AEPA*, "Alberta's Environmental Assessment Process" (December 2015) online (pdf): <<https://open.alberta.ca/dataset/25654f70-8686-407b-b683-0a0521ba50d7/resource/2b4f7770-fd7a-499c-a81d-f0ac2fdee8c3/download/environmentalassessmentprocess-dec2015.pdf>>.

additional information the Director requires to determine whether an EIA is required,¹⁴¹ the Director will determine whether an EIA is required.¹⁴²

The only existing operational CCUS project (excluding EOR) in Alberta is Shell Canada Limited's Quest Carbon Capture and Storage Project (the "**Quest Project**"). The Quest Project completed its required EIA in 2011.¹⁴³ However this does not mean that all future CCUS projects in the Province will require an EIA. The EIA for the Quest Project was required in part, due to its status as a pilot project that received government funding and also to ensure a thorough review of the project.

A completed EIA does not guarantee the CCUS project will be approved, however, provides the applicable regulator (i.e. the AER) with the necessary information to make an informed decision that is in the public interest.¹⁴⁴

(b) Federal

Pursuant to the federal *Impact Assessment Act*¹⁴⁵ ("**IAA**"), the requirement of a federal impact assessment is determined by whether the proposed project falls within the project list set out in Schedule 2 of the *Physical Activities Regulation* ("**PAR**").¹⁴⁶ CCUS projects and the storage of CO₂ are not listed within the *PAR*. However, the federal Minister has discretionary power to designate physical activities that are not prescribed by the regulations, where the Minister is of the opinion that the physical activity may cause adverse effects within federal jurisdiction (such as fishery habitat or navigable waters), adverse direct or incidental effects or concerns the general public.¹⁴⁷

¹⁴¹ *EPEA*, *supra* note 133, s 44(2).

¹⁴² *Ibid*, s 44.

¹⁴³ Government of Alberta, *Environmental Assessment – Shell Canada Limited Quest Carbon Capture & Storage Project – Environmental Impact Assessment (EIA) and application for approval* online: <<https://open.alberta.ca/publications/4921835>>

¹⁴⁴ Alberta Energy, "Regulatory Framework Assessment", *supra* note 4 at 51.

¹⁴⁵ *Impact Assessment Act*, SC 2019, c 28, s 1 [**IAA**].

¹⁴⁶ *Physical Activities Regulations*, SOR/2019-285; and David Wright, "The New Federal Impact Assessment Act: Implications for Canadian Energy Projects" (2021) 59:1 ALR 61 at 75.

¹⁴⁷ *IAA*, *supra* note 145, s 9.

In the event a CCUS project triggers the Minister's discretionary power to designate it, such project will be subject to the requirements and review process set out in the *IAA*, which includes a broader review of the impacts of such designated project.¹⁴⁸

6. AER Approval of Evaluation Wells, Injection Scheme and Injection Wells

(a) Oversight of CCUS Projects

As indicated above, the AER and Alberta Energy have primary oversight over CCUS Projects. When assessing applications for CCUS projects and injection schemes pursuant to an evaluation and/or sequestration lease agreement issued under the *MMA* and the *CS Tenure Regulation*, the AER must consider the impacts to the recovery and conservation of PNG, including the use of underground formations for the storage of PNG. In fact, the *OGCA* contains express language creating statutory paramountcy of recovery and storage of oil and gas over the sequestration of captured CO₂. Specifically, section 39(1.1) states that the AER:¹⁴⁹

“...may not approve a scheme...pursuant to an agreement under Part 9 of the *Mines and Minerals Act* unless the lessee of that agreement satisfies the Board that the injection of the captured carbon dioxide will not interfere with

- (a) the recovery or conservation of oil or gas, or
- (b) an existing use of the underground formation for the storage of oil or gas.”

(b) AER Well Licenses

Pursuant to sections 114 and 116 of the *MMA*, well licenses and approvals from the AER are required prior to drilling evaluation wells or using a well for injection of captured CO₂ in accordance with the *OGCA*.

Under *AER Directive 056: Energy Development Applications and Schedules*,¹⁵⁰ any petroleum industry development that includes wells, pipelines or other structures, requires a licence from the AER to construct and operate. For a CCUS project, an evaluation well(s) may be drilled to acquire specific information needed for approval of an injection scheme.¹⁵¹ A CCUS proponent must apply to the AER for approval of injection and monitoring wells under *AER Directive 051*:

¹⁴⁸ *Ibid.* It is noted that at the time of this paper, the *IAA* was subject to review by the Supreme Court of Canada to determine its constitutionality. At the time of this paper, a decision had not yet been rendered.

¹⁴⁹ *OGCA*, *supra* note 10, s 39(1.1).

¹⁵⁰ Alberta Energy Regulator, *Directive 056: Energy Development Applications and Schedules* (25 March 2021), online: <<https://www.aer.ca/regulating-development/rules-and-directives/directives/directive-056>>.

¹⁵¹ Alberta Energy, “Regulatory Framework Assessment”, *supra* note 4 at 51.

Injection and Disposal Wells – Well Classifications, Completions, Logging, and Testing Requirements which sets out the technical requirements for each injection well (“**Directive 051**”).¹⁵²

After drilling, completion and testing of an injection well, proponents can apply to the AER for injection scheme approval under Directive 065.¹⁵³ A CCUS project must meet the requirements for CO₂ Sequestration Schemes and CO₂ Sequestration detailed in sections 4.1.6 and 4.1.7 of Directive 065.¹⁵⁴ Applications under this directive provide information necessary for the AER to determine that there will be adequate containment of the disposed captured CO₂.

Each of Directive 065, Directive 051 and Directive 056 each contain public consultation requirements such that local stakeholders including proximate landowners and occupants, holders of Crown mineral leases and working interest participants in proximate hydrocarbon recovery projects will have an opportunity to participate in the regulatory process by providing statements of concern.¹⁵⁵ The AER will convene a public hearing, either in a written or in person format, to address public concerns if such concerns are deemed to have standing, cannot be resolved, and if the AER determines that a hearing process is in the best interest of the public. Prior to the AER providing final approval for CO₂ sequestration schemes, the application is referred to the minister of AEPA for review and approval. As part of this review, the minister of AEPA may impose additional conditions. Once final approval is obtained from the AER, the project may commence, subject to the imposed conditions and compliance with applicable regulatory requirements.¹⁵⁶

7. Long-Term Statutory Liability

Arguably the most significant difference between the CCUS and EOR schemes in Alberta is the treatment of long-term liability. The EOR scheme is based on PNG lease rights and governed by the ordinary course liability rules found in the OGCA. As such, the operator (and the working interest participants, jointly and severally in accordance with their proportionate share) of an EOR

¹⁵² Alberta Energy Regulator, *Directive 051: Injection and Disposal Wells – Well Classifications, Completions, Logging, and Testing Requirements* (1 March 1994), online: <<https://www.aer.ca/regulating-development/rules-and-directives/directives/directive-051>> [**Directive 051**].

¹⁵³ *Directive 065*, *supra* note 121.

¹⁵⁴ *Ibid.*

¹⁵⁵ We note that Emergency Response Plans (“**ERPs**”) may also be required by Directive 056 and Directive 065, the requirements for which are further set out under the AER’s *Directive 071: Emergency Preparedness and Response* and may include additional public consultations.

¹⁵⁶ Alberta Energy, “Regulatory Framework Assessment”, *supra* note 4 at 51.

project will remain liable for the wells associated with its project and any necessary remediation work under the *OGCA*. However, under the CCUS-specific regulatory regime, the Crown assumes long-term liability for projects involving the sequestration of captured CO₂, provided that such CCUS project has obtained a closure certificate. Given that the Crown assumes the liability following closure, the Minister retains significant discretion in deciding whether or not to issue a closure certificate.¹⁵⁷ A closure certificate can only be issued to a person that has a sequestration lease agreement; projects involving the storage of CO₂ for other purposes (including pursuant to an EOR scheme) do not fall within the purview of Part 9, regardless of the duration of storage.¹⁵⁸

As per section 120(3) of the *MMA*, the Minister may issue a closure certificate if the Minister is satisfied that:

- (i) the lessee has monitored all wells and facilities and has performed all closure activities in accordance with the regulations¹⁵⁹;
- (ii) the lessee has abandoned all wells and facilities in accordance with the requirements under the *OGCA* and the regulations under Part 9 of the *MMA*;
- (iii) the lessee has complied with the reclamation requirements under the Environmental Protection and Enhancement Act (“**EPEA**”)¹⁶⁰;
- (iv) the closure period specified in the regulations has passed;
- (v) the conditions specified in the regulations have been met; and
- (vi) the captured CO₂ is behaving in a stable and predictable manner, with no significant risk of future leakage.¹⁶¹

Upon issuance of a closure certificate, the Crown becomes the owner of the captured CO₂ and assumes all obligations of the lessee:¹⁶² (i) as owner and licensee under the *OGCA*; (ii) as the person responsible for the injected captured CO₂ under *EPEA*; (iii) as the operator under Part 6

¹⁵⁷ N. Bankes, “Alberta’s approach to the transfer of liability for carbon capture and storage projects” (2018) *Intl J Risk Assessment and Management*, p 6.

¹⁵⁸ Massicotte, “The Changing Legislation and Regulation of CCS Projects”, *supra* note 72 at 321.

¹⁵⁹ *MMA*, *supra* note 10, s 119.

¹⁶⁰ *EPEA*, *supra* note 160.

¹⁶¹ *MMA*, *supra* note 10, s 120(3).

¹⁶² *Ibid*, s 121(1).

of *EPEA* with respect to the land within the location of the agreement; and (iv) under the *Surface Rights Act*¹⁶³.

During the life of a CCUS project, operators are required under the *MMA* and its regulations to pay into the Post-Closure Stewardship Fund (the “**Fund**”).¹⁶⁴ Pursuant to section 122(2) of the *MMA*, the Fund may be used for a number of purposes including:

- (i) to offset costs associated with the long-term monitoring and maintenance of sequestration site assessment for monitoring and closure plan;
- (ii) monitoring the behaviour of captured carbon dioxide that has been injected pursuant to pore space tenure agreements;
- (iii) fulfilling any obligations that are assumed by the Crown pursuant to section 121(1)(b); and
- (iv) paying for suspension costs, abandonment costs and related reclamation or remediation costs in respect of orphan facilities where the work is carried out by the AER, the Director in accordance with *EPEAA* or any of their authorized representatives.

The amount a lessee (operator) pays into the Fund is a fee per tonne of captured CO₂ injected into the location of the carbon sequestration lease at the rate established by the Minister.¹⁶⁵ In accordance with section 23.1 of the *OGCA*, once the AER receives notice issued by the Minister under Part 9 of the *MMA* that the Crown has assumed liability, the AER must amend the licence or approval to reflect that the Crown is the holder of the licence or the approval for that scheme.¹⁶⁶ Consequently, the former holder of the licence or approval for the well, facility or scheme is relieved from all obligations under the *OGCA* with respect to the well, facility or scheme, except as to any outstanding debts owing to the AER.¹⁶⁷

¹⁶³ *Surface Rights Act*, RSA 2000, c S-24.

¹⁶⁴ *MMA*, *supra* note 10, s 122.

¹⁶⁵ *CS Tenure Regulation*, *supra* note 71, s 20.

¹⁶⁶ *OGCA*, *supra* note 10, s 23.1.

¹⁶⁷ Of note is that the Alberta, “RFPP Guidelines” state existing Part 9 provisions of the *MMA* apply to the carbon sequestration lease agreements formed under the RFPP model. However, the Alberta, “RFPP Guidelines” do not explicitly specify that *all* Part 9 provisions, such as the long-term statutory liability provisions, apply to the carbon sequestration lease agreement. Notwithstanding and based upon our discussions to date with Provincial representatives, it is our understanding that the long-term statutory liability provisions within Part 9 of the *MMA* will apply to carbon sequestration lease agreements made through the RFPP competitive process.

E. GENERATION OF CARBON AND CLEAN FUEL CREDITS

Given Alberta's established regulatory framework and incentives in place to encourage CCUS project development, coupled with the abundance of suitable subsurface reservoir capacity, it is expected that CCUS will be at the forefront of emissions reduction projects within the Province. However, in order to further such development, there is still a need for technological innovation and for proponents to realize a return on investment and other benefits in connection with such projects.

Recently, both the federal and provincial governments, including Alberta, have stated that they are open to working collaboratively to further incentivize investment in CCUS.¹⁶⁸ Alberta has committed to enhancing the development of CCUS, as evidenced by both the allocation of evaluation permits and carbon sequestration rights to successful hub proponents, and direct funding, including Emissions Reduction Alberta's ("**ERA**") investment of \$30 million from Alberta's Technology Innovation and Emissions Reduction fund to 11 projects in the Province.¹⁶⁹

Investment in CO₂ capture projects is largely driven by emitter and stakeholder returns from such projects, including credits and emission offsets generated from such projects (which are generally referred to in this paper as "**Credits**"). Credits ensure that emissions reductions targets are met, while also incentivizing renewable and emission reduction project development as well as technology and innovation in connection with such projects. Environmental attributes are the environmental benefits represented by any Credit generated, being among other things, a quantified reduction of GHG emissions.

Federally, carbon emissions are governed by the *Greenhouse Gas Pollution Pricing Act*¹⁷⁰ ("**GGPPA**") which was deemed constitutional by the Supreme Court of Canada in March of 2021.¹⁷¹ The federal carbon pricing scheme is implemented pursuant to the *GGPPA*, while the provincial carbon pricing scheme in Alberta is implemented pursuant to the *Technology Innovation and Emissions Reduction Regulation* ("**TIER Regulation**").¹⁷² The *GGPPA* acts as a backstop,

¹⁶⁸ Nia Williams, "Alberta offers to work with Trudeau on carbon capture – with conditions", *Reuters* (17 February 2023), online: <<https://www.reuters.com/world/americas/alberta-offers-work-with-canadian-govt-carbon-capture-incentives-2023-02-16/>>.

¹⁶⁹ Emissions Reduction Alberta, "Over \$40 Million Investment to Kickstart \$20 Billion in Carbon Capture Projects", online: *Emissions Reduction Alberta* <<https://www.eralberta.ca/funding-technology/carbon-capture-kickstart/>>.

¹⁷⁰ *Greenhouse Gas Pollution Pricing Act*, SC 2018, c 12.

¹⁷¹ *References re Greenhouse Gas Pollution Pricing Act*, 2021 SCC 11.

¹⁷² *Technology Innovation and Emissions Reduction Regulation*, Alta Reg 133/2019 [**TIER Regulation**].

either in whole or in part, when a provincial scheme does not meet the stringency requirements under the *GGPPA*. The *GGPPA* consists of two components:

- (i) the levy on fossil fuels (the “**Fuel Charge**”); and
- (ii) a cap-and-trade system for output-based GHG emissions by large industrial emitters¹⁷³ (“**OBPS**”).

The purpose of the *GGPPA* is to establish minimum pricing standards on carbon prices to incentivize emissions reductions across all sectors of the economy, and to mitigate Canada’s impact on climate change in furtherance of Canada’s commitment to net-zero emissions by 2050. This commitment is enshrined under the *Canadian Net-Zero Emissions Accountability Act*¹⁷⁴, which became law in Canada on June 29, 2021. Canada’s commitment to the Paris Agreement is implemented by the 2030 Emissions Reduction Plan which aims to reduce emissions by 40-50% of the 2005 levels by 2030.¹⁷⁵

In Alberta, AEPA enables the generation of carbon credits through the Alberta Emission Offset System¹⁷⁶ and the generation of emissions performance credits under the *Emission Management and Climate Resilience Act*.¹⁷⁷ The *TIER Regulation* governs the Province’s carbon pricing scheme and establishes the Credits and mechanisms by which emitters are able to meet their emissions reduction targets, reflective of the environmental attribute of a given project or activity. The *TIER Regulation* has been found to meet or exceed the stringency requirements of the *GGPPA* in respect of the matters to which the *TIER Regulation* applies, therefore the OBPS is not at this time applicable in Alberta.

Alberta has reinforced its commitment to bolstering Alberta’s position as a leading developer of CCUS projects through recent amendments to the *TIER Regulation*. In addition to Alberta emission offsets (“**AEOs**”) and emission performance credits (“**EPCs**”) already available under the *TIER Regulation*, the amendments created two new types of carbon credits: (i) sequestration credits (“**Sequestration Credits**”); and (ii) capture recognition tonnes (“**Recognition Tonnes**”),

¹⁷³ *Output-Based Pricing System Regulations*, SOR/2019-266 [**OBPS Regulations**].

¹⁷⁴ *Canadian Net-Zero Emissions Accountability Act*, SC 2021, c 22.

¹⁷⁵ Government of Canada, “Canada’s 2030 Emissions Reduction Plan” (22 June 2022), online (pdf): <<https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/climate-plan-overview/emissions-reduction-2030.html>>.

¹⁷⁶ *TIER Regulation*, *supra* note 172, s 18(1).

¹⁷⁷ *Emissions Management and Climate Resilience Act*, SA 2003, C E-7.8.

both of which are stackable with credits generated under the *Clean Fuel Regulations*.¹⁷⁸ Unlike AEOs, EPCs are generated from the carbon which is sequestered rather than a recognition of a reduction of emissions. The following is a chart created by the Government of Alberta comparing AEOs, Sequestration Credits and Recognition Tonnes:¹⁷⁹

	Emission Offset for Sequestration	Sequestration Credit	Capture Recognition Tonne
Stackable with CFR	✘	✓	✓
Can be banked for future use	✓	✓	✘
Can be sold to other entity?	✓	✓	✘
Can be deducted from TRE	✘	✘	✓
Can be used to meet compliance obligation	✓	✓	✘

Government incentives, including both federal and provincial offsets and credits generated from CCUS projects that can be sold and traded on the carbon credit market are one of the driving forces behind CCUS project growth in the Province. However, a balance needs to be struck to not oversaturate the carbon credit market, devaluing the Credits.

1. Generation of Environmental Attributes and Credits in Alberta

The *TIER Regulation* governs Alberta’s carbon pricing scheme and establishes the Credits and mechanisms by which corporations and emitters are able to meet their emissions reduction targets in Alberta, and where applicable, under the federal system. Pursuant to the *TIER Regulation*, facilities that produce more than 100,000 tonnes of CO₂ are deemed to be regulated by the *TIER Regulation*.¹⁸⁰ Smaller emitters that produce over 2,000 tonnes of CO₂ are eligible to opt-in to the program.¹⁸¹ Facilities regulated under the *TIER Regulation* are exempted from the Fuel Charge under the *GGPPA*, for so long as the *TIER Regulation* continues to meet the federal *GGPPA* stringency requirements.¹⁸²

¹⁷⁸ *Clean Fuel Regulations*, SOR/2022-140 [*Clean Fuel Regulations*].

¹⁷⁹ AEPA, “TIER Regulatory System Amendments: Overview of system amendments” (webinar) (23 January 2023), online (pdf): <<https://www.alberta.ca/assets/documents/epa-technology-innovation-and-emissions-reduction-system-amendments-webinar.pdf>> [AEPA, “TIER Amendments Webinar”].

¹⁸⁰ *TIER Regulation*, *supra* note 172, s 1(1)(cc).

¹⁸¹ *Ibid*, s 4(4).

¹⁸² Provincial and territorial carbon pricing systems are subject to an annual assessment to ensure that they continue to meet the stringency standards. The federal government monitors the changes to provincial systems on an ongoing basis. In assessing stringency, the federal government uses national stringency standards or 'benchmark'

The *TIER Regulation* is subject to review every three years with the first review completed in December 2022. Following feedback from stakeholders, the Government of Alberta released the *Technology Innovation and Emissions Reduction Amendment Regulation*¹⁸³ (the “**Amendment Regulation**”) and the *Administrative Penalty Amendment Regulation*¹⁸⁴, which imposed certain amendments and changes that came into force on January 1, 2023. The amendments enacted by the Amendment Regulation maintain the *TIER Regulation*’s compliance with the federal stringency standards, ensuring that Alberta’s carbon pricing regime remains in place instead of the OBPS.

Among other things, the Amendment Regulation made certain amendments to the *TIER Regulation* as it relates to the use of EPCs, AEOs, Sequestration Credits and Recognition Tonnes (collectively, “**Provincial Credits**”) to reflect the Government of Alberta’s alignment with emissions reduction targets and to promote emissions reduction project development within the Province. The amendments allow for increased use of Provincial Credits, including an increase to the use limits, permitting emitters to use EPCs, AEOs and Sequestration Credits to comply with emissions reduction targets in increasing amounts: 60% in 2023, 70% in 2024, 80% in 2025 and 90% in 2026.¹⁸⁵ The expiration period for EPCs and AEOs was also reduced from a 9-year and 8-year period, respectively, to a 5-year and 6-year period, respectively.¹⁸⁶ Sequestration Credits must be used within the 6-year period beginning the year the net geological sequestration of the associated emission offset occurred.¹⁸⁷ These changes benefit Alberta emitters and CCUS proponents alike by creating fiscal incentives for additional CO₂ capture from industrial facilities, and rewarding both emitters and hub operators more valuable credits that can be used for compliance purposes or traded on the mature credit market.

criteria when assessing provincial and territorial carbon pricing systems. The criteria for the federal government's carbon pricing benchmark is set out in Annex I of the [Pan-Canadian Framework on Clean Growth and Climate Change](#) which set the initial carbon price trajectory up to 2022. In August of 2021, the federal government, with input from Canadian Institute for Climate Choices, released an [Update to the Pan-Canadian Approach to Carbon Pollution Pricing 2023-2030](#) and updated the minimum national standards for the 2023 to 2030 period ensuring such standards are fair, consistent and effective.

¹⁸³ *Technology Innovation and Emissions Reduction Amendment Regulation*, Alta Reg 251/2022 [**Amending Regulation**].

¹⁸⁴ *Administrative Penalty Amendment Regulation*, Alta Reg 250/2022.

¹⁸⁵ *TIER Regulation*, *supra* note 172, s 13(9).

¹⁸⁶ *Ibid*, ss 13(6), 13(5)(g).

¹⁸⁷ *TIER Regulation*, *supra* note 172, s 13(5)(g).

(a) Types of Provincial Credits

Emitters that are subject to the *TIER Regulation*, either because they have voluntarily opted-in or are automatically covered, are required to apply a carbon pollution price per tonne, which increases each year in line with the OBPS until it has reached \$170/tonne in 2030, for emissions that exceed emissions intensity performance standards for the relevant type of activity.¹⁸⁸ The *TIER Regulation* requires regulated facilities to reduce emissions to meet their reduction targets. Facilities that reduce emissions beyond their benchmark can generate EPCs.¹⁸⁹

Where facilities do not specifically meet their benchmark, they are eligible to comply using the following mechanisms:¹⁹⁰

- (i) submit AEOs generated from qualifying emissions reductions outside of regulated facilities;
- (ii) submit EPCs generated from emissions reduced at a facility beyond their benchmark;
- (iii) submit Sequestration Credits generated from converted AEOs;
- (iv) emissions reductions achieved at the facility or use of Recognition Tonnes; or
- (v) obtain fund credits by paying the prescribed price into the TIER fund (which pursuant to TIER is subject to an annual increase in line with the federal requirements).

Although generated from converted AEOs, the newly created Recognition Tonnes are not eligible for compliance purposes and are subtracted directly from an emitters total regulated emissions.

(b) Alberta Emissions Offsets

AEOs are created as a result of projects and activities that have voluntarily reduced their GHG emissions. Within Alberta, AEOs are quantified using Alberta-approved methodologies called quantification protocols which are verified by a third party. In order to qualify for emission offsets,

¹⁸⁸ The carbon price is set at \$65/tonne in Alberta for 2023 and will increase by \$15 each year until it reaches \$170/tonne in 2030.

¹⁸⁹ *TIER Regulation*, *supra* note 172, s 20.

¹⁹⁰ AEPA, “Standard for Completing Greenhouse Gas Compliance and Forecasting Reports” (Version 3.3) (30 January 2023), s 5, online (pdf): <<https://open.alberta.ca/dataset/ee75669d-32f5-4b37-b378-56dc428a98ac/resource/30410c32-e0cd-4fa8-9789-e7f49e401f10/download/epa-tier-standard-completing-greenhouse-gas-compliance-forecasting-reports-version-3-3.pdf>> [AEPA, “Standard for Completing GHG Reporting”].

projects must meet the requirements under the *TIER Regulation*, the “Standard for Greenhouse Gas Emission Offset Developers”¹⁹¹ and a relevant Alberta-approved quantification protocol. Once qualified, AEOs are registered and publicly listed on the Alberta Emission Offset Registry (“AOR”).¹⁹²

(i) *Quantification Protocols*

There are several quantification protocols in place for various types of renewable projects, including quantification protocols for certain types of CCUS projects. Quantification protocols are essential to qualifying a project for AEOs under the *TIER Regulation*. A quantification protocol establishes the methodology for quantifying the net emissions reductions associated with the specific project activity.

The aim of quantification protocols is to ensure that AEOs are only claimed for reductions that otherwise would not have occurred or for those that go beyond business as usual, establishing the requisite “additionality”.¹⁹³ Additionality is the basis on which activities are included in quantification protocols.¹⁹⁴ The established quantification protocols represent a standard approach for the calculation of emissions reduction that is associated with a given project.¹⁹⁵ Once a quantification protocol has been approved, all projects that are implemented pursuant to that protocol shall be considered additional until the protocol is reviewed and/or the credit duration elapses.¹⁹⁶

The quantification protocol that enables a proponent to generate AEOs from a CCUS project is the Quantification Protocol for CO₂ Capture and Permanent Storage in Deep Saline Aquifers¹⁹⁷

¹⁹¹ AEPA, “Standard for Greenhouse Gas Emission Offset Project Developers, Technology, Innovation, and Emissions Reduction Regulation”, version 3.2 (28 April 2023), online (pdf): <<https://open.alberta.ca/dataset/ba00d7a0-e37b-4792-a050-f56bfd968187/resource/beb74477-adf8-4654-b7bf-9a5fa80248b4/download/epa-standard-for-ghg-emission-offset-project-developers-v3-2-2023-04.pdf>> [AEPA, “Standard for Offset Developers”].

¹⁹² Alberta Emission Offset Registry, online: *Welcome to Alberta Carbon Registries* <<https://alberta.csaregistries.ca/>>.

¹⁹³ Bankes & Brennan: “EOR: Regulation and carbon crediting”, *supra* note 5; and AEPA, “Technical Guidance for Offset Protocol Development and Revision” (31 July 2018) at 17, online (pdf): <<https://open.alberta.ca/dataset/db089833-59cc-404b-99ed-56b51bbd9242/resource/726366d0-25fa-4bd8-b333-3df78eed1eb2/download/offsetprotocoldevelopment-jul31-2018.pdf>> [AEPA, “Guidance for Offset Protocol Development”].

¹⁹⁴ Bankes & Brennan: “EOR: Regulation and carbon crediting”, *supra* note 5 at 60; and AEPA, “Guidance for Offset Protocol Development”, *supra* note 193.

¹⁹⁵ Bankes & Brennan: “EOR: Regulation and carbon crediting”, *supra* note 5 at 23.

¹⁹⁶ *Ibid* at 60.

¹⁹⁷ AEPA, “Quantification Protocol for CO₂ Capture and Permanent Storage in Deep Saline Aquifers” (23 June 2015), online (pdf): <<https://open.alberta.ca/dataset/73895a97-2e8b-4870-a1bc-0faece4ff896/resource/5461945c-8781->

(the “**CO₂ Storage Protocol**”). Quantification protocols do not exist for all possible CCUS projects and are notably missing for mature oil and gas fields and salt caverns.

An emitter can use AEOs generated from a qualified CCUS project to comply with its obligations under the *TIER Regulation* and any AEOs not used to reach emissions reduction compliance targets, can be sold in the Alberta market. AEOs generated in Alberta are currently not available to be used for compliance or sold in the federal market. The federal OBPS permits recognized units that are generated from a recognized offset protocol that appear on the List of Recognized Offset Programs and Protocols.¹⁹⁸ The federal OBPS does not currently recognize Alberta’s CO₂ Storage Protocol as a recognized offset protocol. Therefore CCUS projects in Alberta are unable to generate AEOs that can be used or sold in the federal market.

A. Quantification Protocol for CO₂ Capture and Permanent Storage in Deep Saline Aquifers

The CO₂ Storage Protocol was published in June of 2015 and relates to projects that capture CO₂ emissions and transfers them to a permanent storage in deep saline aquifers which results in a permanent reduction in CO₂ emissions. There are three main components for a CCUS project to fall within the parameters of the CO₂ Storage Protocol¹⁹⁹:

- (i) CO₂ capture infrastructure, which includes a process modification to a facility to capture and compress vented CO₂ emissions;
- (ii) CO₂ pipelines to transport CO₂ from the capture facility to the injection well(s); and
- (iii) disposal of CO₂ through injection wells into deep saline aquifers.

The CO₂ Storage Protocol is intended to cover the full carbon capture and storage chain from capture through compression, transport, injection and storage. Under the CO₂ Storage Protocol, the offset credit generation period is set at 20 years, with the ability to apply for five year

44b0-96be-020e5bbcd98f/download/quantificationprotocolco2-jun23-2015.pdf> [AEPA, “CO₂ Storage Protocol”].

¹⁹⁸ Environment and Climate Change Canada (“ECCC”), “General Guidance on Using Eligible Alberta Emission Offsets as Recognized Units for Compensation Units for Compensation under the Federal OBPS” (August 2020), online (pdf): <https://www.canada.ca/content/dam/eccc/documents/pdf/climate-change/pricing-pollution/Alberta_Guidance_Using_RU_OBPS.pdf> [ECCC, “Guidance on Offset Credits”]; See also Government of Canada, “List of Recognized Offsets” (7 March 2022), online: <<https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/output-based-pricing-system/list-recognized-offset-programs-protocols.html>> [Government of Canada, “List of Recognized Offsets”].

¹⁹⁹ AEPA, “CO₂ Storage Protocol”, *supra* note 197, s 1.0.

extensions. A longer length in the credit generation period acknowledges the expensive nature of the projects and that there is little to no revenue stream from the activity other than the sale or use of the offset credits that are generated.

Baseline emissions are calculated using a projection-based baseline model to quantify the emissions that would have been emitted but for the project. The methodology used to quantify the emissions and projected baseline is the metered quantity of CO₂ injected into the deep saline aquifer for the purposes of permanent storage, being the total quantity of CO₂ that has been measured directly upstream of the injection wellheads. Emissions that are associated with the capture, compression, transportation and injection are subtracted from the baseline emissions in order to determine the net GHG reduction that is achieved by the project. The purpose of using projected methodology is to ensure the baseline correctly accounts for the year to year variation in CO₂ that is captured and injected.²⁰⁰

To qualify, project developers must demonstrate that the offset project meets the requirements of the offset system, the *TIER Regulation*, the quantification protocol and other guidance documents. Pursuant to the CO₂ Storage Protocol, the developer will need to provide sufficient evidence to demonstrate the following²⁰¹:

- (i) the project captures CO₂ directly from an industrial or non-industrial facility;
- (ii) the project is injecting into a deep saline aquifer capable of permanently storing CO₂ gases and each injection site in the project must have:
 - a. one or more approved carbon sequestration lease agreements in accordance with the *MMA*²⁰² and *CS Tenure Regulation*²⁰³; and
 - b. an approval for the CO₂ Storage Scheme under the AER's Directive 065 Unit 4,²⁰⁴ Directive 051²⁰⁵ and section 39 of the *OGCA*²⁰⁶,

²⁰⁰ *Ibid*, ss 1.1., 2.0.

²⁰¹ *Ibid*, s 1.2.

²⁰² *MMA*, *supra* note 10.

²⁰³ *CS Tenure Regulation*, *supra* note 71.

²⁰⁴ *Directive 065*, *supra* note 121.

²⁰⁵ *Directive 051*, *supra* note 152.

²⁰⁶ *OGCA*, *supra* note 10.

- (iii) the project must be in good standing with all operating permits and relevant regulations in Alberta;
- (iv) the reductions achieved by the project are quantified based on actual measurements and monitoring as indicated in the CO₂ Storage Protocol; and
- (v) metering of injected gas volumes to calculate injected CO₂ volumes placed as close to the injection point as reasonable to address the potential for fugitive emissions at the injection site.

The CO₂ Storage Protocol recognizes that methane and nitrous oxide emissions may also be emitted as a result of combustions and upstream production emissions. As a result, all such GHG emissions must be quantified in the calculation of net GHG reduction resulting from project.

(c) Emission Performance Credits

EPCs are one of the ways in which regulated facilities under the *TIER Regulation* can meet their compliance options. EPCs are tracked and managed by the Alberta EPC Registry and are generated when a regulated facility reduces its GHG emissions below the reduction target specified in the *TIER Regulation*. Under the *TIER Regulation*, one tonne of CO₂e below the emitter's performance target is the equivalent of one EPC. EPCs can be a major incentive for CCUS project proponents and emitters looking to capture major point source pure CO₂ emission streams. The capture will generally result in an over-reduction of facility emissions and EPCs can be used to fund the construction of the capture infrastructure, which accounts for the majority of the cost in a CCUS project.

EPCs eligible for trading and purchasing through the Alberta EPC Registry may only be used once and can only be used in the year subsequent to when they were created.²⁰⁷ In order for facilities to generate EPCs, and before the EPCs can be used as a compliance option, the emitter must submit compliance reports and be issued an EPC on the Alberta EPC Registry.²⁰⁸

(d) Sequestration Credits

Adding further support to Alberta's CCUS regime, the Amendment Regulation established Sequestration Credits and Recognition Tonnes in connection with CCUS projects in Alberta.

²⁰⁷ *TIER Regulation*, *supra* note 172, s 13(6).

²⁰⁸ CSA Registries, "Alberta Emission Performance Credit Registry" online : *Alberta Emission Performance Credit Registry: About*<https://alberta.csaregistries.ca/GHGR_Listing/EPC_About.aspx>.

Sequestration Credits are stackable with credits generated under the Clean Fuel Regulations and must be used within the 6-year period beginning in the year in which the net geological sequestration of the associated emission offset occurred.²⁰⁹ Sequestration Credits can only be issued for converted AEOs that meet the following requirements²¹⁰:

- (i) the emissions for net sequestration must meet the requirements for sequestration under the *TIER Regulation*;
- (ii) the geological sequestration must have occurred in or after 2022; and
- (iii) the sequestered CO₂e for the AEO must have been captured by a large emitter or at an opted-in facility.

Sequestration Credits are subject to the *TIER Regulation's* credit use limits and once an AEO has been converted to a Sequestration Credit, this conversion cannot be undone.²¹¹ The creation of Sequestration Credits reinforces Alberta's commitment to incentivizing CCUS projects and technology by creating Credits generated from, and a recognition of, permanently sequestered CO₂, rather than a recognition of emissions reduction. The addition of Credits generated solely by the process of sequestering CO₂ and which are stackable with credits generated under the Clean Fuel Regulations gives proponents of a CCUS project increased marketability to trade such Sequestration Credits on the mature market. However, as CCUS projects develop, the potential influx of Credits has the potential to oversaturate the market. As proponents begin generating the newly available Credits, it will be interesting to see how proponents determine which Credits they will generate and whether such attributes will be converted into other attributes (i.e. Recognition Tonnes).

(e) Recognition Tonnes

Recognition Tonnes are the second additional Provincial Credit created under the Amendment Regulation. Sequestration Credits may be converted into Recognition Tonnes, allowing emitters to reduce the total regulated emissions by deducting sequestered emissions. A Recognition Tonne is created by further converting a Sequestration Credit and must comply with several rules

²⁰⁹ *TIER Regulation*, *supra* note 172, s 13(5)(g).

²¹⁰ *Ibid*, s 20.1(1).

²¹¹ AEPA, "TIER Amendments Webinar", *supra* note 179.

when determining the total regulated emissions for the large emitter or opted-in facility, including²¹²:

- (i) a Recognition Tonne may only be used for a large emitter or opted-in facility where the CO₂ sequestered for the associated emission offset was captured;
- (ii) a Recognition Tonne may only be used once; and
- (iii) a Recognition Tonne in recognition of a net geological sequestration that occurred in a year may only be used for that year.

In order to be converted into a Recognition Tonne, the Sequestration Credit must meet the following requirements²¹³:

- (i) the CO₂ that was geologically sequestered for the associated emission offset must have been captured at the large emitter or opted-in facility of the person who is applying to convert the sequestration credit; and
- (ii) the geological sequestration must have occurred in 2023 or a subsequent year.

Converted Recognition Tonnes cannot be converted back into a Sequestration Credit and one Recognition Tonne represents one CO₂e tonne.

Unlike Sequestration Credits, Recognition Tonnes cannot be used by an emitter to meet their compliance obligations under the *TIER Regulation*. Rather, Recognition Tonnes are subtracted directly from the emitter's regulated emissions such that their target benchmark is reduced. Recognition Tonnes are ineligible to be banked for future use or to be traded on the mature market.²¹⁴

(f) Converting Sequestration Credits and Recognition Tonnes

The ability to generate and use Sequestration Credits and Recognition Tonnes is a new option for emitters that came into effect with the recent amendments to the *TIER Regulation*. Some guidance related to the conversion process and use of Recognition Tonnes and Sequestration

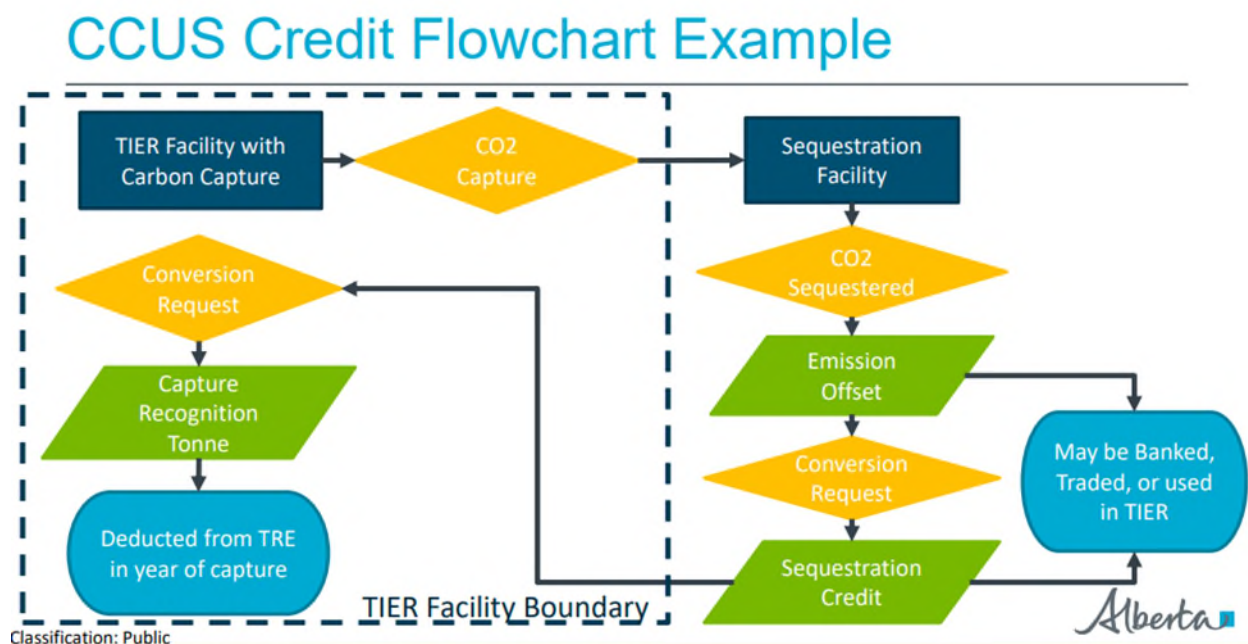
²¹² *TIER Regulation*, *supra* note 172, s 13(1)(3.1)

²¹³ *Ibid*, s 20.2(2).

²¹⁴ AEPA, "TIER Amendments Webinar", *supra* note 179 at 13.

Credits has been included in the “Standard for Greenhouse Gas Emission Offset Developers”²¹⁵ and “Standard for Completing Greenhouse Gas Compliance and Forecasting Reports”.²¹⁶ However, the reasoning and benefits for which an emitter may choose to use a Sequestration Credit instead of an AEO or a Recognition Tonne instead of a Sequestration Credit is not yet apparent.

Given the use of Sequestration Credits and Recognition Tonnes is a new option for emitters, the market involving such Provincial Credits will continue to establish and the various factors driving the use will become apparent. The path in which certain Provincial Credits may be generated and converted into others is not simple, nor is there an abundance of guidance on the process for conversion of the various Provincial Credits. The Government of Alberta has prepared the below chart summarizing the Provincial Credits which may be generated from CCUS projects:²¹⁷



2. Federal GHG Systems and Application with CCUS Projects in Alberta

As of the date of this paper, the federal OBPS²¹⁸ is not in effect in Alberta, as the *TIER Regulation* currently meets the federal stringency standards, while the Fuel Charge is in effect within the Province. The purpose of the OBPS is to encourage project activities across Canada that reduce

²¹⁵ AEPA, “Standard for Offset Developers”, *supra* note 191.

²¹⁶ AEPA, “Standard for Completing GHG Reporting”, *supra* note 190.

²¹⁷ *Ibid.*

²¹⁸ *OBPS Regulations*, *supra* note 173.

GHG emissions or remove them from the atmosphere by enabling the generation of emission offset credits.

Notwithstanding that Alberta's Emission Offset Program is currently recognized by the OBPS, only certain activities are recognized and CCUS projects and their related activities are not recognized for the purposes of generating emission offsets for registration on the OBPS system. AEOs generated by a CCUS project in Alberta under one of the applicable quantification protocols, unless converted into a Sequestration Credit or Recognition Tonne, are not currently eligible for use under the federal OBPS system.²¹⁹

3. Generating Additional Federal Credits

(a) Federal Clean Fuel Regulations

As part of the incentive to drive technology and innovation for clean fuels, technologies and processes, the federal government introduced the *Clean Fuel Regulations*.²²⁰ The Clean Fuel Regulations incorporate the requirements under the *Renewable Fuels Regulations*,²²¹ seek to decarbonize liquid transportation fuels used in Canada and enable investment in the clean energy space as well as the adoption of technologies and processes that use clean energy.

The Clean Fuel Regulations were adopted under the *Canadian Environmental Protection Act, 1999*²²² and require liquid fossil fuel primary suppliers to gradually reduce the carbon intensity of the gasoline and diesel produced and sold for use in Canada.²²³

The Clean Fuel Regulations establish a credit market and provide fuel suppliers with flexibility to meet the requirements in a way that is adaptive to suppliers' operations.²²⁴ To meet reduction

²¹⁹ *Clean Fuel Regulations*, *supra* note 178.

²²⁰ *Ibid.*

²²¹ *Renewable Fuel Regulations*, SOR/2010-189. This regulation will be repealed on September 30, 2024, see ss 175, 176(2).

²²² *CEPA*, *supra* note 57.

²²³ Government of Canada, "What are the Clean Fuel Regulations?" (7 July 2022), online (pdf): <<https://www.canada.ca/en/environment-climate-change/services/managing-pollution/energy-production/fuel-regulations/clean-fuel-regulations/about.html>>.

²²⁴ Government of Canada, "Compliance with the Clean Fuel Regulations" (17 February 2023), online (pdf): <<https://www.canada.ca/en/environment-climate-change/services/managing-pollution/energy-production/fuel-regulations/clean-fuel-regulations/compliance.html>>.

obligations and requirements under the Clean Fuel Regulations, producers and importers of gasoline and diesel used in Canada must create or buy credits.²²⁵

The Clean Fuel Regulations include compliance options that recognize actions that reduce a fossil fuel's carbon intensity through CO₂e emissions reduction projects at a point along the lifecycle of a liquid fossil fuel. Credits under the Clean Fuel Regulations are governed by specific quantification method provided by ECCC.²²⁶

(b) Generating Credits Under the Clean Fuel Regulations

In order to be eligible for credit creation under the Clean Fuel Regulations, a project must comply with all requirements for a given credit generation pathway.²²⁷ A quantification method currently exists for carbon, capture and storage and are quantified pursuant to the Quantification Method for CO₂ Capture and Permanent Storage.²²⁸

The crediting period for credits generated under the Clean Fuel Regulations is 10 years for all projects with the exception of: CO₂ capture and permanent storage or enhanced oil recovery with CO₂ capture and permanent storage, in which case, such crediting period shall be 20 years, which may be extended for a one-time 5 year extension, subject to eligibility criteria.²²⁹

(i) *Quantification Method for CO₂ Capture and Permanent Storage*

In order to generate credits under the Clean Fuel Regulation, projects are required to meet four main components under the CO₂ Capture Quantification Method, and are subject to other additional eligibility criteria as outlined in the quantification method²³⁰:

²²⁵ *Ibid.*

²²⁶ ECCC, "Clean Fuel Regulations: Quantification Method Development Guidance Document" (July 2022), online (pdf): <https://publications.gc.ca/collections/collection_2022/eccc/En4-419-1-2022-eng.pdf> [ECCC, "CFR Quantification Method Guidance Document"].

²²⁷ *Ibid.*, s 3.0. In order to be eligible for credit creation, a project must: (i) result in the reduction, sequestration or use of CO₂e emissions that are released at any point along the lifecycle of a fossil fuel in the liquid state at standard conditions or result in the production of co-processed low-carbon-intensity fuel; (ii) determine its reduction, sequestration or use of CO₂e emissions with a quantification method that is applicable to the project and provided by ECCC; and (iii) have the action specified in the quantification method that allows the project to begin to reduce, sequester or use CO₂e emissions that occurred on or after July 1, 2017 unless the quantification method provides that the activity may be carried out before that date.

²²⁸ ECCC, "Clean Fuel Regulations: Quantification Method for CO₂ Capture and Permanent Storage" (July 2022), online (pdf): <https://publications.gc.ca/collections/collection_2022/eccc/En4-474-2022-eng.pdf> [ECCC, "Quantification Method for CO₂ Capture"].

²²⁹ ECCC, "CFR Quantification Method Guidance Document", *supra* note 226, s 4.1.

²³⁰ ECCC, "Quantification Method for CO₂ Capture", *supra* note 228, s 1.0.

- (i) industrial processes or fuel combustion activities that generate CO₂;
- (ii) CO₂ capture and purification infrastructure, which can be included in a new-built facility or retrofitted to an existing facility;
- (iii) a CO₂ pipeline to transport CO₂ from the capture facility to the injection site(s); and
- (iv) long-term geological storage at sites where CO₂ is injected for permanent storage.

A CCUS project seeking to use the CO₂ Capture Quantification Method is ineligible if the project injects CO₂ for the purposes of enhanced oil recovery and must meet the list of requirements to be an eligible project outlined under section 3.0 of the CO₂ Capture Quantification Method.²³¹

Under the CO₂ Capture Quantification Method, the owner or operator of the facility that injects the CO₂ into the geological formation is the default creator. A different registered creator may be identified if there is an agreement between the parties, and such entity must register the project as the creator in accordance with section 21 of the Clean Fuel Regulations.²³² The crediting period for eligible credits under the CO₂ Quantification Method is 20 years and projects may be eligible for a single five year extension period.²³³

4. Marketability of Provincial and Federal Credits

(a) The Market for Canadian Offsets

As previously noted, there are two types of markets for offset credits to be generated and traded, both federally and provincially. Compliance markets are generally monitored and regulated by mandatory compliance schemes, either provincially or federally. A voluntary market is that which exists outside of the mandatory scheme and permits emitters to purchase carbon offsets on a voluntary basis that will not be used in the compliance market and can be used for furthering other initiatives.²³⁴

More opportunities are being developed for companies to invest and undertake renewable projects eligible for the creation of offset credits, as is evidenced by the newest creation of

²³¹ *Ibid*, s 3.0.

²³² *Ibid*, s 4.2.

²³³ *Ibid*, s 4.1.

²³⁴ ECCC, “The Essentials: Carbon Markets 101”, online (pdf): <https://www.canada.ca/content/dam/eccc/documents/pdf/climate-change/ghg-offset/indigenous-toolkit/The%20Carbon%20Essentials_EN-A.pdf> [ECCC, “Carbon Markets 101”].

Sequestration Credits and Recognition Tonnes under the amendments to the *TIER Regulation*. As both federal and provincial stringency requirements increase and emitters have stricter obligations to meet emissions reductions targets, there will be an increasing demand for Credits. However, as more companies begin to undertake decarbonization projects with the aim of generating offset credits, there is a risk that too many companies will generate offset credits, flooding the markets and decreasing the price, thereby disincentivizing companies from pursuing and investing in renewable projects, such as CCUS. Alberta's TIER pricing offers some support to credit generators as it increases \$15 every year from the current \$65/tonne, to a mandated maximum of \$170/tonne in 2030, as is the case in all jurisdictions across Canada.

The 25 announced CCUS hubs in Alberta have been approved under the RFPPs and it is estimated that seven of the new projects have the potential to increase CCUS capacity in the Province to approximately 56 million tonnes of CO₂ per year by 2030, with the remaining 18 projects further increasing provincial carbon capacity.²³⁵ If all of the Alberta CCUS hubs go forward, there will be a large influx of AEOs that are available on the AOR. In addition, if CCUS projects can generate Recognition Tonnes or Sequestration Credits, as well as credits to satisfy obligations under the Clean Fuel Regulations, then an additional source of demand may be introduced.

(b) Stacking of Offset Credits

Credit stacking is one of the additional benefits offered by the various offset credit regulatory regimes and allows credits to be generated for use on different platforms under either the federal or provincial systems. Credit stacking occurs when multiple offsets are generated from the same emissions reduction project or the same offsets are eligible for use under multiple regimes. Credit stacking prohibits double counting or issuing more than one credit for the same environmental attribute.²³⁶ Double counting refers to a situation where two parties claim the same reduction or sequestration of CO₂ and is mitigated through the carbon crediting systems themselves, for

²³⁵ Canada Energy Regulator, "Market Snapshot: New projects in Alberta could add significant carbon storage capacity by 2030", (21 December 2022), online (pdf): <<https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/market-snapshots/2022/market-snapshot-new-projects-alberta-could-add-significant-carbon-storage-capacity-2030.html>>.

²³⁶ ECCC, "Carbon pollution pricing: options for a Federal Greenhouse Gas Offset System chapter 20 (28 June 2019), online (pdf): <<https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/federal-offset-system/chapter-20.html>>.

example through the use of quantification protocols and crediting registries. Generally, there are three ways in which double counting can occur.²³⁷

- (i) Double issuance: occurs where more than one credit is issued for the same reduction of CO₂. This situation may arise where two different projects or activities claim the same reduction of CO₂.
- (ii) Double use: occurs where more than one emitter utilizes the same offset credit, which is guarded against through the creation of registries and the serialization of offset credits which are tradeable in the crediting market.
- (iii) Double claiming: arises where an offset credit is issued for the reduction or sequestration of CO₂ for a project or activity and another entity then uses the same reduced or sequestered CO₂ towards their own emissions reduction targets. In the context of CCUS projects, this becomes a more technical exercise as CCUS projects increasingly involve a network of transportation and storage infrastructure, which may be shared by several proponents.

CCUS projects that are regulated under both TIER and the Clean Fuel Regulations, may be able to generate Credits that are eligible for use under both regulations. Qualified CCUS projects may generate Sequestration Credits and/or Recognition Tonnes, which may be stacked with credits generated under the Clean Fuel Regulation, meaning the same project is eligible to generate Credits under both regimes. Noting however, that projects that generate AEOs which are not converted to Sequestration Credits, cannot also generate Credits under the Clean Fuel Regulations.²³⁸

(c) Risks with Offset Credits and the Crediting Market

Generating offset credits and the purchase of such credits in the market is not without risk. For offset generation, emitters are eligible to generate such credits through the use of quantification protocols.

²³⁷ Carbon Offset Research and Education, “Carbon Offset Guide: Exclusive Claim to GHG Reductions”, online: *Carbon Offset Guide* <<https://www.offsetguide.org/high-quality-offsets/exclusive-claim-to-ghg-reductions/>>; see also Global CCS Institute, “Global Status of CCS 2022” (2022), online (pdf): <https://status22.globalccsinstitute.com/wp-content/uploads/2022/12/Global-Status-of-CCS-2022_Download_1222.pdf>.

²³⁸ AEPA, “TIER Amendments Webinar”, *supra* note 179 at 14.

These protocols exist to quantify and recognize GHG reductions that otherwise would not have occurred, or projects that go beyond business as usual, to establish the requisite “additionality”. As CCUS projects become more standard, or business as usual, there is the risk that the quantification protocol will be withdrawn and emitters will no longer be able to use the quantification protocol to generate offset credits.²³⁹

For those purchasing offset credits on the market, there is also the small risk that such Credits are invalid because such Credits were based on inaccurate information or the CO₂ on which the offset credit was generated, was later released due to a loss of containment. This is a liability transportation and sequestration providers will need to manage in connection with their services agreements for same. Depending on the system, the proponent or the owner of the credit will be required to replace the credit or the credit may be replaced from a pool of credits.²⁴⁰ There is no guarantee that all offset credits generated and bought on the market are valid and there is some risk to the buyer purchasing such credits.

(d) Legislative Gaps

As emissions reduction and storage technology continues to develop and become more prevalent, so too will the regulatory schemes governing such projects. Notwithstanding that both the federal and provincial scheme in Alberta are well developed, there are a number of apparent gaps in the operation of a given project. One of the primary areas in which we will likely see development over the coming years is in the context of the network surrounding a CCUS project and joint ownership.

One of the greatest challenges to further developing CCUS technology and projects is the cost associated with such projects. The ability to generate Credits is one of the driving factors legitimizing the costs associated with the development of such projects and technologies. However, not every party to a given project is able to generate Credits. The existing programs recognize and enable emitters who have generated the captured CO₂ to generate Credits. However, this does not enable the proponents or operators of the hubs who actually sequester the CO₂ to generate Credits, due to the principles against double counting. Given the costs

²³⁹ For example, on January 28, 2013 the Quantification Protocol for Acid Gas Injection was withdrawn from the Alberta Offset System as a stand-alone GHG protocol because it no longer met the “additionality requirements on the Offset System and became common practice. Upon the withdrawal, projects that were approved on the AOR were eligible to remain for the remainder of the crediting period, but were not eligible to receive an extension. Alberta Environment and Sustainable Resource Development, Memorandum: Notice to Termination of the Quantification Protocol for Acid Gas Injection (28, 2013).

²⁴⁰ ECCC, “Carbon Markets 101”, *supra* note 234.

associated with CCUS projects, including the required infrastructure and technology, without proper revenue streams that provide a fair return on investment, there is the risk that such projects become too costly to make them viable and long-term options.

F. POLICY AND LEGISLATIVE GAPS

As is typically the case when policies are announced or new or amended legislation is enacted, there remain a number of policy and legislative gaps that will need to be addressed as CCUS projects move forward into the development phase in Alberta. Below we have highlighted a few considerations from a policy and legislative perspective where we believe issues may arise and more clarity will be sought by interested parties.

1. Oversight by Government of Alberta

Despite the Province's comprehensive CCUS regulatory regime, the legislative framework of the *MMA* and *CS Tenure Regulation* provides the Minister with significant discretion in overseeing CCUS development in the Province. Granting an administrative decision-maker broad discretionary powers is not unusual in the context of regulatory law. Discretion creates a regulatory framework with a degree of flexibility, which may be viewed as particularly important in the context of CCUS as it is an evolving area of scientific study and technological innovation. However, developers of CCUS projects in Alberta must be cognizant of the Minister's broad discretion and the resulting lack of certainty, despite the regulatory regime's detailed legislative stipulations.

The starkest example of the Minister's discretion in granting CCUS development rights in the Province is provided by sections 9(a)(iii) and 9(b) of the *MMA*. These sections provide:

9 Notwithstanding anything in this Act or any regulation or agreement, the Minister, on behalf of the Crown in right of Alberta, may ...

(a) enter into a contract with any person or government of Canada or of a province or territory respecting ... (iii) the storage or sequestration of substances in subsurface reservoirs; ...

(b) issue an agreement²⁴¹ (i) containing a provision that is in variation of a provision of this Act or the regulations that would otherwise apply to the agreement, or (ii) making inapplicable a provision of this Act or the regulations that would otherwise apply to the agreement.

²⁴¹ An "agreement" is defined in the *MMA* at s 1(1)(a) as "an instrument issued pursuant to this Act or the former Act that grants rights in respect of a mineral, subsurface reservoir, or geothermal resource, but does not include a notification, a transfer referred to in section 12, a unit agreement or a contract under section 9(a)". Both an Evaluation Permit and a Carbon Sequestration Lease fall under the definition of "agreement."

Essentially, despite the clear legislative provisions on how a CCUS evaluation permit or sequestration lease agreement may be granted and the contents thereof in the *MMA* and *CS Tenure Regulation*, the Minister maintains the overarching discretion to vary from this procedure.

Reflecting this discretion, the RFPP process expressly stated that the Province reserves the right to amend, suspend, postpone or cancel the outlined process at its sole discretion.²⁴² The RFPP provided that any final CCUS lease agreements would be issued under section 9 of the *MMA* and reflect the existing provisions of Part 9.²⁴³ Furthermore, the Province also reinforced that it had the right to amend any CCUS lease agreement or location in the agreement as required or determined by the Province.²⁴⁴

Despite the permissive language of Alberta's CCUS legislation, an administrative decision-maker does not have unlimited discretion. Though discretionary decisions will generally be given considerable deference, that discretion must be exercised in accordance with the boundaries imposed in the statute, the principles of the rule of law, the principles of administrative law, the fundamental values of Canadian society, and the principles of the *Charter*.²⁴⁵ However, the discretion afforded to the Minister introduces uncertainty, which proponents will contend with when proposing, financing, developing and operating CCUS projects.

2. Regulatory Overlap Between Alberta Energy and the AER

In addition to the broad Ministerial discretion, the existing CCUS regulatory framework does not always provide a clear delineation of responsibilities as between the Minister and Alberta Energy on the one hand and the AER on the other.²⁴⁶ One example already discussed in Part D is the possible duplication of review of MMV and closure plans for sequestration lease agreements and licensing applications. Clarification of roles between the regulator and the government, particularly in relation to the issuance of closure certificates, was one of the recommendations of the Government of Alberta's Regulatory Framework Assessment in 2013 and yet it appears to remain an ongoing issue.²⁴⁷ Previous commentators have also commented on the unclear allocation of responsibility between the Minister and regulator, and the lack of clarity for the departure from the

²⁴² Alberta, "RFPP Guidelines", *supra* note 88, s 1.3.

²⁴³ *Ibid* at Appendix A.

²⁴⁴ *Ibid*.

²⁴⁵ *Baker v Canada (Minister of Citizenship & Immigration)*, 1999 SCC 699 at para 56.

²⁴⁶ Alberta Energy, "Regulatory Framework Assessment", *supra* note 4 at 52.

²⁴⁷ *Ibid*.

typical division of powers between Alberta Energy (the policy setting body) and AER (the body responsible for technical regulation).²⁴⁸ As further discussed in Part G, below, Alberta Energy appears to be taking on a more expansive role in relation to the sequestration lease agreements for the proposed hubs, and claiming responsibility for matters that, outside the CCUS context, would be determined either by the free market or the existing regulators.

3. Industry Cooperation and Transparency over Monitoring, Measurement and Verification Principles

One of the key principals underlying the CCUS regulatory framework in Alberta are the MMV requirements for projects and associated activities. Proponents of CCUS are required to create a MMV plan in accordance with the guidelines established by the provincial government.²⁴⁹ The MMV plan will set out the activities that a proponent is responsible for in order to identify risks and enable the completion of regulatory requirements and project approvals.²⁵⁰ The MMV plan will expire on the earlier of the third anniversary of its approval date or the date that the lease is renewed. A lessee must submit a new MMV plan for approval no fewer than 90 days before its expiry date.²⁵¹

In addition to the MMV Plan, CCUS proponents in Alberta must also submit a Risk Management Plan (“**RMP**”).²⁵² The RMP will specifically address the risks associated with CO₂ storage at a project site, expressed in terms of the combination of severity of the consequences of a hazardous event and the associated likelihood of its occurrence.²⁵³ The project site is suitable for CCUS if the RMP demonstrates that the storage of the CO₂ stream at the candidate site does not pose unacceptable risks to other resources, the environment and human health and safety, or to project developers, owners, operators and the Crown (post closure).²⁵⁴ Specifically, the proposed site

²⁴⁸ Nigel Bankes, “Alberta makes significant progress in establishing a legal and regulatory regime to accommodate carbon capture and storage (CC) projects” (3 November 2010), online (blog): *Ablawg* <<https://ablawg.ca/2010/11/03/alberta-makes-significant-progress-in-establishing-a-legal-and-regulatory-regime-to-accommodate-carbon-capture-and-storage-ccs-projects/>>; see also Massicotte, “The Changing Legislation and Regulation of CCS Projects”, *supra* note 72 at 325.

²⁴⁹ Alberta Energy, *Monitoring, measurement, and verification principles and objectives for CO₂ sequestration project*, version 1 (5 April 2023), online (pdf): <<https://open.alberta.ca/dataset/333f8585-59ce-486a-b62c-6219e18d4f0e/resource/1fb8d05c-5e06-4398-b9c4-e03d74221d73/download/enr-mmvm-principles-objectives-for-co2-sequestration-projects-version-2.pdf>> [**MMV Guidelines**].

²⁵⁰ *Ibid* at 4.

²⁵¹ *Ibid* at 8-9; *CS Tenure Regulation*, *supra* note 71, s 16(1).

²⁵² *MMV Guidelines*, *supra* note 249 at 4.

²⁵³ *Ibid*.

²⁵⁴ *Ibid*.

must demonstrate suitability for CO₂ sequestration using the risk assessment process conducted using the CSA 2741-12 (Geologic Storage of Carbon Dioxide) requirements.²⁵⁵

Going forward, MMV activities will be necessary to ensure the safe and reliable operation of CCUS projects and associated activities. Verification of the data associated with an MMV plan ensures sequestration projects are operating as permitted and predicted, and compares the measured and predicted performance.²⁵⁶ As CCUS projects and related activities continue to progress and increase in number in the Province, one of the main areas which MMV will likely continue to survey is the potential for long term CO₂ injection and reservoir pressurization, including and up to induce seismic activity. Throughout operations, a CCUS project must collect data that sufficiently provides:²⁵⁷

- suitable evidence of conformance of CO₂ stream and affected fluids with the storage complex;
- assurance of geological containment of the CO₂ stream and affected fluids within the storage complex, including that the amount sequestered to support a permanent reduction of greenhouse gases as described in the CO₂ Storage Protocol;
- suitable evidence of no adverse effect to other pore space users within hydraulically connected saline formations;
- suitable evidence that there are no significant adverse effects on health, the environment or other resources; and
- verification of and updating models and simulations annually to continually inform capacity estimates and conformance verification.

There is still a lot to be understood about the effects that injecting CO₂ subsurface can have on the environment, including but not limited to: (i) plume dynamics; (ii) pressure waves; and (iii) induced seismicity. MMV obligations are a necessary piece of the CCUS regulatory scheme, ensuring continued monitoring, mitigation of potential risks, developments and advancements to technology, as well as continued education and development of the regulatory and legislative

²⁵⁵ *Ibid* at 7.

²⁵⁶ *Ibid* at 4.

²⁵⁷ *Ibid* at 8.

landscape. In addition to necessary government and regulatory oversight, we expect there will also be a need for proponents to share data and information underlying MMV reporting to formulate industry coalitions to address concerns regarding subsurface interactions. This exchange of information could be facilitated through the regulator to ensure information is shared in a way that respects competitively sensitive information, while creating a space for open exchange.

(a) Plume Dynamics

One of the unknowns related to CCUS projects and related activities is the migration of CO₂ plumes following injection. As was noted in the Government of Alberta's 2013 Regulatory Framework Assessment, plume migration was, and continues to be, an area that requires continued monitoring to ensure the CO₂ plume has not introduced potential leakage that was not anticipated.²⁵⁸ It was noted that because many of the trapping methods used for CCUS operate over a long time-scale period, complete cessation of the movement of a CO₂ plume is unlikely.²⁵⁹

Uncertainties may exist in relation to the injected CO₂ plume into neighbouring pore space or freshwater aquifers causing potential leakage or contamination, however there are well documented technological mitigations such as 4D modeling and mapping of geologic subsurface layers that act as seals to properly contain injected CO₂ such that conformance of plume migration to modeled data will be well studied over time. Leaked CO₂ which was previously accounted for in certain Credits may invalidate the use of such Credits by the owner thereof.

(b) Seismic Activity and Pressure Waves

Injection of dense phase CO₂ will inevitably generate a pressure wave that far exceeds the area of the CO₂ plume. CCUS projects located adjacent to each other could create pressure waves or pressure build-up²⁶⁰ which may interact directly with those of a neighbouring project or may reactivate pre-existing faults, causing seismicity. In order to ensure any such pressure waves do not interfere with neighboring activities, it will be essential for proponents to share information regarding ongoing activities. Where pressure waves overlap, this could in future have the potential for decreases in injectivity or an increase in pressure which could raise CO₂ or brine to levels that impact groundwater, or reactivate pre-existing faults. It is noted that there is currently no

²⁵⁸ Alberta Energy, "Regulatory Framework Assessment", *supra* note 4 at 100.

²⁵⁹ *Ibid* at C-5, definition "Stable".

²⁶⁰ Storage Summary Report at 69.

prohibition on pressure waves exceeding the sequestration lease. In the event that pressure waves do overlap, this will favour first movers in the CCUS industry, as later proponents will have to increase injection pressure to accomplish the same levels of storage.

A report issued by Stanford University following a 5.6 magnitude earthquake in the Peace River region in Alberta was triggered by oil sands water injection. The report went on to consider whether long-term sequestration operations have the potential to induce similar seismic events. It was suggested that going forward, to ensure safe injection and long term storage of CO₂, there will be a need to understand fault reactivation potential, and high-sensitivity monitoring for seismicity throughout the duration of a CCUS project.²⁶¹

As part of the site planning process for CO₂ injection wells, proponents conduct extensive analysis to map the subsurface region and identify any structures present. Required MMV plans will monitor for seismic events using a micro-seismic array which continuously monitors for seismic activity. The equipment is sensitive enough to detect seismic events that are far smaller than events that could be felt at surface. Publicly available data from the Quest Project shows that its micro-seismic array has detected small seismic events in the subsurface layers below the storage complex. The events detected to date are not large enough to be felt at surface and pose no risk to containment. This information is being shared with the Government of Alberta and is publicly available to other hub operators seeking to develop MMV plans for future CCUS hubs. Pre-existing fault identification, MMV obligations, reporting and the sharing of such data among industry participants going forward will be instrumental in further developing the technologies available for CCUS projects, as well as refining the regulatory scheme in the Province. Through the sharing of MMV information among industry participants, regulators and proponents will better understand: (i) the impact of pressure fronts on adjacent projects and how multiple injection sites may be managed effectively; (ii) the possibility of seismicity; and (iii) the development of safe and sustainable injection practices, all while creating monitoring, mitigation and risk-based management strategies to address such questions.²⁶²

²⁶¹ Ryan Schultz et al, "Disposal From In Situ Bitumen Recovery Induced the ML 5.6 Peace River Earthquake" (2003), 50:6 *Geophysical Research Letters* at 4.4 [**Stanford Report**].

²⁶² *Ibid* at 4.4.

G. OPTIONS FOR REGULATING OPEN ACCESS CCUS HUBS AND PIPELINES

1. Introduction

As discussed, Alberta is proceeding with a hub model to grant carbon sequestration lease agreements²⁶³ as opposed to taking a centralized infrastructure planning approach or granting tenure to individual emitters wishing to store only their own CO₂. In its 2022 Second RFPP process for carbon sequestration hubs, the Government of Alberta indicated sequestration lease agreements would include requirements around open access to hubs for third party emitters and rates to provide the project proponent with a “just and reasonable cost recovery”.²⁶⁴ While it did not set out specific requirements for open access and just and reasonable rates, the Government of Alberta did set out the following two objectives for this proposed economic regulation:

- (i) Mitigating market power – preventing agreement holders from controlling access and exerting unreasonable conditions as a result of market position.
- (ii) Public good – achieving efficient development of CCUS infrastructure to reduce costs, support CCUS development, reduce the environmental impact of the pipeline system, minimize safety risks and support development of EOR markets.²⁶⁵

Open access to CCUS infrastructure has been of concern in other jurisdictions, including the European Union who have incorporated requirements for third party access to transportation and storage sites in their *Directive on the Geological Storage of Carbon Dioxide*.²⁶⁶ In addition, the IEA has identified access to shared transport and storage infrastructure as a key regulatory issue in CCUS hub development.²⁶⁷

²⁶³ Government of Alberta, “Carbon Capture, Utilization and Storage: Developing Storage Hubs to Meet Growing Demand” (21 December 2022), online (pdf): <<https://www.alberta.ca/assets/documents/energy-fact-sheet-storage-hub-development.pdf>>.

²⁶⁴ Government of Alberta, “Request for Full Project Proposals for Carbon Sequestration Hubs” (3 March 2022) at pp 3, 12, online (pdf): <<https://www.alberta.ca/assets/documents/energy-request-for-full-project-proposals-rfpp-guidelines.pdf>> [**Government of Alberta, “Second RFPP”**].

²⁶⁵ *Ibid* at pp 12-13.

²⁶⁶ Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 on the geological storage of carbon dioxide and amending Council Directive 85/337/EEC, European Parliament and Council Directives 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC, 2008/1/EC and Regulation (EC) No 1013/2006 at Article 21 [**EU Directive**].

²⁶⁷ International Energy Agency, “CCUS Legal and Regulatory Handbook”, (July 2022), at pp 16, 18, online (pdf): <<https://iea.blob.core.windows.net/assets/bda8c2b2-2b9c-4010-ab56-b941dc8d0635/LegalandRegulatoryFrameworksforCCUS-AnIEACCUSHandbook.pdf>> [**IEA CCUS Handbook**].

Some have suggested that at least some form of economic regulation is needed for the development of CCUS infrastructure in order to allow for centralized infrastructure planning, economies of scale and to address potential market power problems as the CCUS industry develops.²⁶⁸ Options for economic regulation may range from treating CCUS infrastructure as a regulated utility, to requiring an open season on new transportation and storage projects to solicit interest and determine necessary capacity before construction, to a mixed model with commercial agency and recourse for parties where a commercial agreement cannot be arrived at, such as with Alberta's common carrier and processor regimes, discussed below. The Government of Alberta has already awarded 25 CCUS hubs²⁶⁹ pursuant to the RFPP and has not taken any steps to implement utility style regulation, nor has an open season for access been mandated.²⁷⁰ Hub project proponents have entered into the RFPP process as commercial entities and so implementing utility style regulation at this stage would seem to be a disincentive to proponents to move ahead with their projects.²⁷¹ However, the above objectives suggest that the Government of Alberta is considering economic regulation in some form in order to ensure open access and fair rates for hubs, though perhaps not in the strictest sense as with a regulated utility.

In this section we look at the potential approaches to the regulation of CCUS infrastructure to ensure "open access" and "just and reasonable rates" as may be included in the sequestration lease agreement as well as alternatives, including a commercial and market based approach with no economic regulation and a common carrier approach.

2. Approaches to Third Party Access in Sequestration Lease Agreements

The final form of the sequestration lease agreements to which hub proponents will be expected to agree remains under development at the time of writing. The sequestration lease agreements are expected to include provisions ensuring that third party emitters have open access to carbon sequestration services and pore space at fair service rates.

It is unknown how disputes between hub proponents and third party emitters will be resolved and whether this will be addressed through regulation, existing regulatory avenues (e.g. through the

²⁶⁸ Bankes & Nilson, *supra* note 67 at 251; see also IEA CCUS Handbook, *supra* note 267 at p. 84.

²⁶⁹ Government of Alberta, "Carbon capture, utilization and storage – Hub development process" <<https://www.alberta.ca/carbon-capture-utilization-and-storage-hub-development-process.aspx>>.

²⁷⁰ We note that an open season prior to building CO₂ transportation infrastructure was one of the recommendations of the Regulatory Framework Assessment, though this has not been implemented by the Government of Alberta at this time. See Alberta Energy, "Regulatory Framework Assessment", *supra* note 4 at p. 42.

²⁷¹ Bankes & Nilson, *supra* note 67 at 248.

AER²⁷²) or as a new process set out within the terms of the sequestration lease agreements themselves. How the Government of Alberta addresses dispute resolution raises several procedural and substantive questions about the regulation of open access to CO₂ transportation and sequestration services. One key question will be to identify the entity that will adjudicate such disputes, including whether such decisions will fall to the AER or the Minister.

(a) Is Ministerial discretion an appropriate decision making forum to adjudicate open access and 'fair and reasonable rates'?

If the Province of Alberta incorporates the Minister into a dispute resolution or the decision making process, it will be a departure from other similar regulatory regimes with respect to how access and rates are determined. As discussed in Part F, there is some lack of clarity of the responsibilities allocated between the Minister and the AER under the current regulatory regime. There is a similar lack of clarity here in relation to the Minister's potential powers and responsibilities under the proposed sequestration lease agreements. This lack of clarity creates significant uncertainty for hub proponents as commercial entities faced with significant investment decisions. Having fundamental terms and conditions governing sequestration hubs subject to political decision making could pose an unreasonable investment risk and create a barrier to the development of this industry in Alberta.

(b) How will open access and 'fair and reasonable rates' be determined?

CCUS proponents are waiting to understand other specific questions, such as how will open access be determined and hub capacity be allocated given the finite capacity for both sequestration pore space and for transportation to a hub? Will the principled requirements of open access under sequestration lease or transportation and sequestration service agreements enable project proponents to provide priority capacity to project owners, over third party emitters? What constitutes a just and reasonable cost recovery, and what criteria will be referred to for this determination? We note that proponents in the RFPP process were required to include their commercial strategy or business plan for the proposed hub, including approaches to accepting volumes of CO₂, soliciting clients and setting service rates and volumes already secured through an anchoring project or third party agreements. Depending on the final form of the sequestration lease agreement, the answers to the above questions may require parties to amend these

²⁷² Alberta Energy Regulator, "Alternative Dispute Resolution Program" online: <[https://www.aer.ca/protecting-what-matters/giving-albertans-a-voice/alternative-dispute-resolution#:~:text=Anyone%20involved%20in%20an%20energy,%2D8311%20\(toll%20free\)>](https://www.aer.ca/protecting-what-matters/giving-albertans-a-voice/alternative-dispute-resolution#:~:text=Anyone%20involved%20in%20an%20energy,%2D8311%20(toll%20free)>)>.

commercial arrangements which are already in motion.²⁷³ Further, we anticipate hub proponents will require further clarity on these and other questions before entering into the sequestration lease agreements in their final form.

(c) Market Based approach

The use of Ministerial discretion and a potential dispute resolution process creates uncertainty for project proponents who are expending significant capital and taking on a large amount of long term commercial and operational risk in developing these projects. Questions of this nature in Alberta have long been resolved by the Alberta Utilities Commission (“**AUC**”) and AER in rate regulated industries where they balance long term investment certainty for project proponents and reasonable rates for customers.

However, incorporating aspects of a regulated utility model in CCUS would mean a reviewable and regulated return on capital and investments,²⁷⁴ which could fundamentally change the calculus for project proponents. Proponents may have entered into the RFPP process expecting market based revenues and a market oriented approach to open access and pricing as being most consistent with an industry where 25 hubs have been selected, inherently mitigating the risk of market influence. Most CCUS project proponents would rather the free market be allowed to function in commercial rate making decisions, as has been the case in gas processing. Alternatively, as is discussed below, a common carrier approach administered by the AER according to its rules of practice, instead of the Minister of Energy in accordance with discretionary power, may be appropriate in order to ensure predictable results of disputes related to open access and reasonable rates.²⁷⁵

In 2011, the Government of Alberta kicked off a multi-stakeholder Regulatory Framework Assessment process to review and make recommendations in respect of existing and future regulations related to CCUS in Alberta.²⁷⁶ One of the principles espoused by the Regulatory Framework Assessment working group in relation to open access was that “[m]arket considerations should be the primary driver behind access to CO₂ pipelines. In this regard,

²⁷³ Government of Alberta, “Second RFPP”, *supra* note 297 at pp 6, 8.

²⁷⁴ For example, under section 37 of the *Gas Utilities Act*, RSA 2000, c G-5, the Alberta Utilities Commission determines a rate base for the utilities and then fixes a fair rate of return; see also Bankes & Nilson, *supra* note 67 at 247.

²⁷⁵ Alberta Energy, “Regulatory Framework Assessment”, *supra* note 4 at 41, 73 ; see also Bankes & Nilson, *supra* note 67.

²⁷⁶ Alberta Energy, “Regulatory Framework Assessment”, *supra* note 4 at 7.

pipeline operators and third parties should be expected to explore all reasonable avenues of private negotiation before applying to the regulator for access.”²⁷⁷

Prioritizing market considerations would allow hub proponents to first allocate capacity for their partners and equity participants who have invested in or backstopped the development of the hub before contracting with third party emitters for any excess capacity. Under a commercial approach, capacity allocation procedures could also be negotiated between the parties within each hub’s negotiated transportation and storage agreements. Given the expectation that numerous hubs will eventually be developed and operational, if a third party cannot come to reasonable terms for sequestration services at one hub, they may negotiate with another.

In relation to rate setting, as unregulated commercial facilities, proponents may suggest that pricing for access should reflect market principles and that regulation of rates may be inappropriate or unnecessary.²⁷⁸ Further, each hub project carries with it unique considerations which may affect pricing in the market, such as the proponent’s technical expertise and creditworthiness, as well as geographical considerations related to the hub and the interested third party. Third party emitters may also have unique service needs which puts them in the best position to survey the market and determine which hub(s) and rate(s) are most appropriate for their service needs.

This approach may be limited, however, by geographical area and the number of hubs with available capacity at a reasonable distance from the third party emitter.

3. Common Carrier or Common Sequestration Model

Recognizing that there may be instances where parties cannot come to a reasonable commercial agreement and that some geographical areas may not be served by as many hubs as others, developing an approach similar to the common carrier and common processor regimes already in place for oil and gas pipelines and processing facilities may be a suitable option to address the need for third party access to sequestration services and CCUS infrastructure. Common carrier and common processor declarations help to ensure that the owners of oil and gas rights can

²⁷⁷ *Ibid* at 41.

²⁷⁸ Bankes & Nilson, *supra* note 67 at 247-248.

access pipeline transportation and processing infrastructure in order to access market benefits from the resources that they own and avoid issues of drainage.²⁷⁹

While CCUS infrastructure does not currently fit in to the common carrier regime, this could be accomplished by an amendment to the *OGCA*.²⁸⁰ CCUS infrastructure may include a pipeline gathering system connecting emitters to a hub, analogous to a pipeline under the common carrier designation, while a sequestration hub may be analogous to a processing facility as it provides the service of sequestering a party's carbon. Unlike a common processor, however, a designation for common sequestration may need to give consideration to how a hub proponent prioritizes their sequestration capacity and also consider the commercial arrangements hub proponents may already have with their partners and equity participants for sequestration in order to finance and develop the project. Further, unlike a gas processor, a sequestration hub has a finite ultimate storage capacity so the addition of unexpected third party volumes may be shortening the operating life of the CCUS project that the project proponents have invested in to decarbonize their own emissions, unless they can acquire additional pore space. The Regulatory Framework Assessment working group also included recommendations that the common carrier regime be amended to apply to CO₂ pipelines and that a mechanism be created to provide for third party access to existing sequestration services.²⁸¹

A potential benefit of adopting a common carrier or common sequestration regime is that the Government of Alberta, project proponents and third party emitters could draw on the existing expertise of both the AER and the AUC for access and rate setting matters. The AER, in its capacity as the Regulator under the *OGCA*, already has experience in dealing with similar matters of access in the oil and gas space. While not directly analogous, there are a number of similarities between the considerations that the AER will draw on when making a common carrier or common processor designation and concerns of open access to carbon sequestration services and/or to sequestration pore space.²⁸²

²⁷⁹ Allen E Ingelson, ed, *Canada Energy Law Service – Alberta*, loose-leaf (consulted on 28 March 2023) (Toronto: Carswell, 1990-) ch 30 at 3251 [*Canada Energy Law Service*]; in Alberta, common carrier and common processor matters are governed by Sections 48 and 53, respectively, of the *OGCA*.

²⁸⁰ Bankes & Nilson, *supra* note 67 at 245.

²⁸¹ Alberta Energy, "Regulatory Framework Assessment", *supra* note 4 at 41, 73.

²⁸² The criteria that the AER will consider when evaluating a common carrier or processor order application are set out in *Directive 065*. The AER will consider whether the applicant has demonstrated that: "(i) producible reserves are available for transportation through an existing pipeline; (ii) there is a reasonable expectation of a market for the substance that is proposed to be transported by the common carrier operation; (iii) the applicant could not make reasonable arrangements to use the existing pipeline, the designation of a delivery point, the proportion of production to be delivered to the pipeline, and/or the setting of the transportation fee to be paid; and (iv) the

While the common carrier and common processor regimes are based upon the underlying principles of the OGCA and are often concerned with preventing sterilization of resources, the regime could be adapted to serve the Province's current hub model approach to awarding sequestration pore space. Since Alberta Energy is responsible for awarding sequestration pore space and has developed the hub model, including the selection of 25 proposed projects, a third party emitter who has invested the capital in CO₂ capture infrastructure (which is substantial²⁸³) would have only a finite number of hubs with which to negotiate for transport and storage of CO₂, if it was unable to develop or purchase an interest in its own hub. However, emitters have several acceptable avenues for compliance with provincial or federal emissions reductions requirements, including electrification and the purchase of Credits in the open market. Similar to existing common carrier and common processor regimes, the first step would be commercial negotiation before seeking recourse to a common carrier or common sequestration designation.

In the common carrier or common sequestration context, a third party emitter may instead have to demonstrate that: (i) they have CO₂ available for transportation and/or sequestration; (ii) they were unable to negotiate reasonable access to the applicable CCUS infrastructure on commercial terms; and (iii) and the proposed CO₂ pipeline or sequestration hub is the only economically feasible way or the most practical way to transport or sequester the third party's CO₂, or is clearly superior environmentally. Similarly, the Regulatory Framework Assessment working group suggested an application for sequestration be subject to certain limited scenarios.²⁸⁴ We suggest these considerations could be assessed by the AER in the event of a dispute, rather than settled by the Minister.

proposed common carrier operation is the only economically feasible way, the most practical way to transport the substance in question, or clearly superior environmentally", *Directive 065* at 1.3.4, 1.4.4.; The criteria that the AER will consider when evaluating a common processor application are "(i) producible gas reserves are available for processing and processing facilities are needed; (ii) reasonable arrangements for use of processing capacity in the subject processing plant could not be agreed upon by the parties; (iii) the proposed common processor operation is either the only economically feasible or most practical way to process the gas in question or is clearly superior environmentally; and (iv) When an application is being made under sections 53(5)(a) or 53(5)(b) of the OGCA for the allocation of production or a direction of the total volume of gas from the pool to be processed at the plant the applicant could not make reasonable arrangements on these matters", *Directive 065* at 1.3.4; see also *Home Oil Limited's Application for a Common Processor Order and Rateable Take Samburg Area* (26 June 1991) ERCB Decision D91-8 at 7.1.

²⁸³ With the cost of capture representing approximately 80% of the overall cost of a CCS project, it is hard to imagine an emitter making such an investment without first having made transport and storage arrangements for a guaranteed initial term, but in a case where one hub encounters operational issues it is conceivable that emitters with existing capture capability may be seeking alternative transport and storage arrangements.

²⁸⁴ Alberta Energy, "Regulatory Framework Assessment", *supra* note 4 at 73 - 74.

Some additional principles applicable to pipeline common carrier designations under the *OGCA* may also be applicable in the CCUS context, for example “the desirability of avoiding unnecessary duplication of facilities.”²⁸⁵ In such cases it may make more environmental and economic sense for a third party emitter to procure space on an existing carbon pipeline in order to access a hub, rather than develop duplicate infrastructure to transfer their own carbon to a hub. However, the operational complexities of having connected pieces of infrastructure operated by various parties along the value chain to achieve CO₂ transport have yet to be fully identified and solved.

With respect to rate setting, under the *OGCA*, in the event the proponent is subject to a common carrier or common processor designation and the third party user cannot agree to the tariff to be charged for such access, either of the parties may apply to the AUC to fix the tariff.²⁸⁶ The AUC is already well familiar with setting tariffs in the common carrier and common processor context and we propose the Government of Alberta could further draw on this expertise in setting tariffs in respect of sequestration services and access to sequestration pore space, if parties cannot come to commercial terms on their own.

The common carrier regime is a system that is well known and well understood by industry, and will enable adjudication of commercial disputes by bodies such as the AER and AUC who already perform this function for other industries and also play a key role in licensing and operation of CCUS hubs. The use of the existing commercial carrier regime is more efficient and may also add more certainty to the process than disputes solved by ministerial discretion or a dispute resolution process under development. It would also promote a market based approach, allowing parties the space to negotiate commercial agreements for transportation and sequestration of CO₂ while providing a regulatory backstop in the event appropriate access for a particular third party emitter cannot be achieved through commercial negotiations. Additionally, similar common carrier regimes for pipeline owners exist at the interprovincial level and such a model could be adapted to other jurisdictions within Canada.²⁸⁷

²⁸⁵ *Signalta Resources Ltd. Common Carrier Sugden Grand Rapids H and Colony Undefined Pools* (16 April 1992), ERCB Decision D 92-1 at 7 (from Canada Energy Law Service).

²⁸⁶ *OCGA*, *supra* note 10 s 55.

²⁸⁷ See, for example *Canada Energy Regulator Act*, SC 2019, c 28, s 239; see also *Pipelines Act, 1998*, SS 1998, c P-12.1, ss 10, 19.

H. GOVERNMENT INCENTIVES FOR CCUS

Many jurisdictions acknowledge the need for some form of government incentives and policy frameworks to foster the development of CCUS industries and technologies as a tool for climate change mitigation. While some risks to investment in CCUS projects may be appropriately managed by the private sector who are familiar with the risks associated with developing large infrastructure projects, such as operational and construction risks, other risks of the developing CCUS market may be more appropriately addressed by government policies and financial incentives.²⁸⁸ These risks and barriers to investment in CCUS projects may include market failures across the supply chain, including lack of appropriate pricing, risks of asset stranding through adoption of newer technologies in subsequent competitive facilities and limitations in experience and information.²⁸⁹

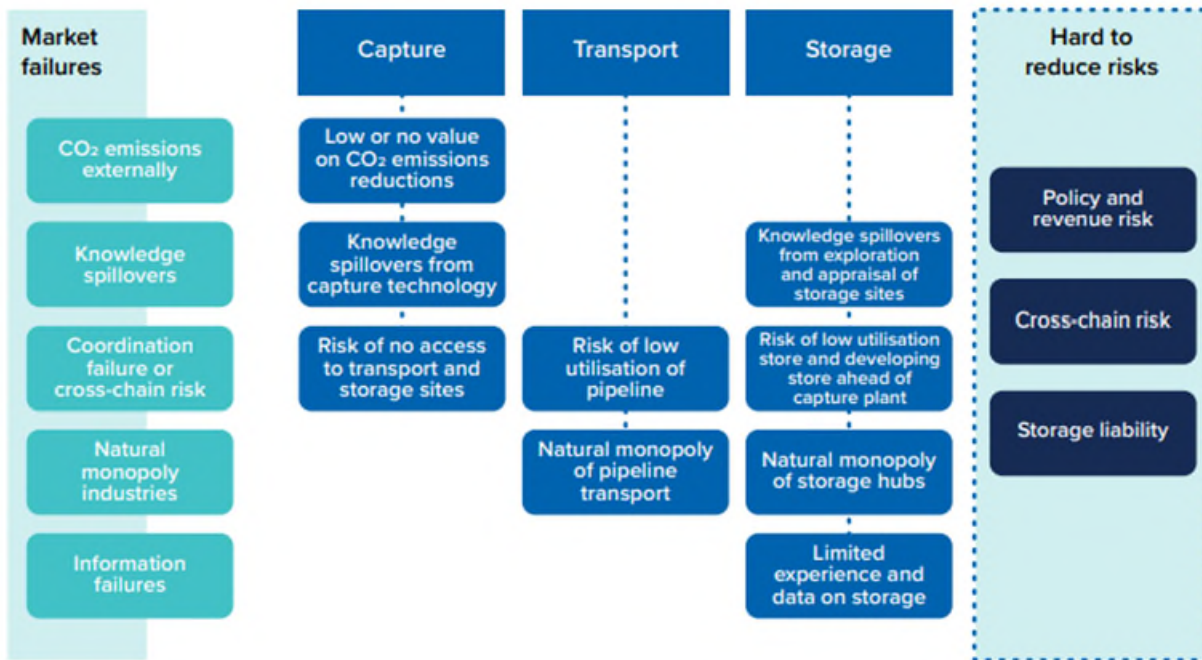
These market failures and risks are helpfully captured in the below illustration, borrowed from the Global CCS Institute's *Policy Priorities* report:²⁹⁰

²⁸⁸ Alex Zapantis, Alex Townsend, Dominic Rassool, "Policy Priorities to Incentivise Large Scale Deployment of CCS" (April 2019), Global CCS Institute at p 4, online: <<https://www.globalccsinstitute.com/wp-content/uploads/2019/04/TL-Report-Policy-priorities-to-incentivise-the-large-scale-deployment-of-CCS-digital-final-2019.pdf>>.

²⁸⁹ *Ibid* at 7-8.

²⁹⁰ *Ibid* at 7.

Figure 1: Market failures across the CCS supply chain



*Market failures occur when the operation of the free market leads to an inefficient allocation of goods and services from society's perspective. For example, rational decisions made by individual firms to maximise financial performance may not be in the best interests of broader society.

[†]Risks that are not possible to mitigate or can only be partially mitigated.

Previously, CCUS projects were often developed for use in the EOR space and were able to use revenues generated by EOR to finance and develop the project.²⁹¹ However, as jurisdictions implement goals and strategies for climate change mitigation, CCUS projects are centering less on EOR and more toward permanent geological sequestration or other uses, thus requiring different revenue streams, funding and incentive models. For example, a report by the Global CCUS Institute found that, outside of EOR, investments in large scale CCUS projects globally has been largely supported by grant funding, rather than debt financing as risks associated with a developing industry may make qualifying for debt financing more difficult.²⁹² Carbon pricing and emissions regulation, tax credits and elements of state ownership or investment have also been used in jurisdictions around the world to incentivise the development of CCUS projects.²⁹³ One example is the public-private cooperation model of Norway's Longship CCUS project, developed

²⁹¹ *Ibid* at 11.

²⁹² *Ibid* at 54.

²⁹³ *Ibid* at 11-13.

in response to a need to overcome investment barriers, such as uncertainty of market potential and policy, to encourage CCUS development.²⁹⁴ One of the key principles behind the state support agreements developed for Norway’s Longship project is that state funding will only cover actual costs up to a certain limit, with the expectation that parties will either sell emissions credits into the EU’s Emissions Trading Systems or sell surplus capacity to third party customers to generate income.²⁹⁵

In Canada, carbon pricing and the creation of Credits from recognized environmental attributes is one tool being used to promote the development of CCUS as a means of meeting climate mitigation goals and is discussed in Part E of this paper. Additionally, several Canadian jurisdictions, including the Federal Government and some provinces, have implemented various forms of incentives and funding for the development of CCUS technologies and projects.

1. Federal Incentives

There are a number of programs at the Federal level aimed at incentivizing investment in the development of technologies and projects in the energy transition and clean technology space, including CCUS. Possibly the most impactful of these is the recently announced Investment Tax Credit (“**CCUS ITC**”) for eligible CCUS projects.

(a) CCUS ITC

As part of the 2022 Federal budget (“**Federal Budget 2022**”), the Federal Government announced a new refundable ITC to promote the development of and investment in CCUS projects²⁹⁶. Pursuant to the 2022 Federal Budget, the CCUS ITC would apply to eligible expenses incurred by CCUS project developers after 2021 through 2040.²⁹⁷ The Federal Government subsequently released draft legislation in respect of the CCUS ITC in August 2022²⁹⁸ (the “**Draft CCUS ITC Legislation**”).

²⁹⁴ CCS Norway, “Developing Longship – Key Lessons Learned” (2020) at p 12, <<https://gassnova.no/app/uploads/sites/6/2020/11/Gassnova-Developing-Longship-FINAL.pdf>>.

²⁹⁵ *Ibid* at 26.

²⁹⁶ Department of Finance Canada, *Budget 2022*, “Tax Measures: Supplementary Information” (7 April 2023) at 20-24, online (pdf) <<https://www.budget.canada.ca/2022/pdf/tm-mf-2022-en.pdf>> [**Federal Budget 2022**].

²⁹⁷ *Ibid* at 21.

²⁹⁸ Department of Finance Canada, “Legislative Proposals Relating to Income Tax and Other Legislation” (9 August 2023) <<https://fin.canada.ca/drleg-apl/2022/ita-lir-0822-l-2-eng.pdf>> [**Finance Canada, “Draft CCUS ITC Legislation**”].

The 2023 federal budget (“**Federal Budget 2023**”) reaffirmed the Federal Government’s intention to move forward with the CCUS ITC and announced additional details in response to consultations following the release of the Draft CCUS ITC Legislation.²⁹⁹

The proposed rate of the CCUS ITC depends on the type of expense and the date in which the expense is incurred. Between January 1, 2022 and December 31, 2030, the following rates apply:

- (i) 60% for expenses related to eligible equipment used in direct air capture projects;
- (ii) 50% for expenses related to eligible equipment used in projects other than direct air capture projects; and
- (iii) 37.5% for expenses related to eligible transportation, storage and use equipment.³⁰⁰

The CCUS ITC will be phased out after 2030. Between January 1, 2031 and December 31, 2040, the rates are one-half of those rates described above.³⁰¹ After 2040, the CCUS ITC will be eliminated.

The CCUS ITC is expected to apply to eligible expenses (“**Eligible Expenses**”). An Eligible Expense is comprised of three components and may be claimed: (i) on eligible equipment (“**Eligible Equipment**”); (ii) with an eligible use (“**Eligible Use**”); or (iii) as part of a qualified eligible project (“**Eligible Project**”). Each of these relevant components is discussed further below.

(i) *Eligible Equipment*

Eligible Equipment is equipment of which the sole use is to capture, transport, store or use CO₂ as part of an Eligible Project situated in Canada. Equipment that captures CO₂ in Canada, compresses it and transports it to another jurisdiction to be stored will be considered to be used in Canada.³⁰²

Additionally, Federal Budget 2023 announced that dual-use equipment producing heat or power, or that uses water, and that is used for CCUS together with another process will now be eligible for the CCUS ITC, on a pro-rated basis based on the proportion of energy balance or material

²⁹⁹ Department of Finance Canada, *Budget 2023*, “Tax Measures: Supplementary Information” (28 March 2023) at 22 <<https://www.budget.canada.ca/2023/pdf/tm-mf-2023-en.pdf>> [**Federal Budget 2023**].

³⁰⁰ Finance Canada, “Draft CCUS ICT Legislation”, *supra* note 298 at 31.

³⁰¹ *Ibid.*

³⁰² Federal Budget 2022, *supra* note 296 at 21.

balance of the equipment supporting the CCUS process over the first 20 years of the project, provided that the following conditions are satisfied:

- (i) the equipment meets all other conditions for the availability of the CCUS ITC;
- (ii) where the equipment produces heat or power, more than 50% of the energy balance must be expected to be used to support either the CCUS process or hydrogen production eligible for the Clean Hydrogen Investment Tax Credit; and
- (iii) any CO₂ emissions resulting from equipment producing heat or power must be used, or must be captured and stored.³⁰³

The CCUS ITC may only be claimed by one owner of a piece of equipment so a subsequent owner may not claim the CCUS ITC if a previous owner has claimed the CCUS ITC in respect of the same piece of equipment.

(ii) Eligible Use

Eligible Uses are either: (i) the storage of CO₂ in underground geological formations in eligible jurisdictions; or (ii) the storage of CO₂ in concrete that meets the 60% mineralization requirement, as validated by a qualified third party. Per Budget 2023, the eligible jurisdictions for geological sequestration are British Columbia, Alberta, and Saskatchewan.³⁰⁴

The use of CO₂ for EOR is not an eligible use.³⁰⁵

If a portion of the Eligible Expense will not be utilized for an Eligible Use, the CCUS ITC is reduced by the percentage of CO₂ that will be put to the ineligible use.³⁰⁶

(iii) Eligible Project

An Eligible Project is a qualified CCUS project that supports a CCUS process by capturing CO₂ that would otherwise be released into the atmosphere or directly from ambient air, transporting

³⁰³ Federal Budget 2023, *supra* note 299 at 31.

³⁰⁴ *Ibid* at 31.

³⁰⁵ Federal Budget 2022, *supra* note 296 at 22.

³⁰⁶ *Ibid* at 23.

captured carbon or storing or using captured carbon.³⁰⁷ Specifically, in order to be qualified, the project:

- (i) must be expected to support the capture of CO₂ in Canada;
- (ii) must have had an initial project evaluation issued by the Minister of National Resources, in respect of the project following the filing of the most recent project plan that meets certain enumerated requirements;
- (iii) must ensure at least 10% of the total quantity of captured carbon per year that the project is expected to support is for storage or use in an Eligible Use in each of the project's first 20 years;
- (iv) must comply with all applicable federal, provincial and municipal environmental laws, by-laws and regulations; and
- (v) is not a project that is operated to service a facility that existed prior to April 7, 2022 and undertaken for the purposes of complying with emissions standards regulations under the *Reduction of Carbon Dioxide Emissions from Coal-fired Generation of Electricity Regulations*.³⁰⁸

(b) Other Federal Funding Opportunities

In addition to the CCUS ITC, the Federal government has developed a number of application-based programs and funds aimed at the emissions reduction sector, which may apply to CCUS projects. These include the Strategic Innovation Fund (“SIF”) which provides investments in innovative projects intended to help with the growth of Canada’s economy.³⁰⁹ The SIF’s Net Zero Accelerator initiative is targeted toward industrial sectors to promote the reduction of greenhouse gas emissions and at the time of writing is accepting “transformative” decarboniation proposals.³¹⁰ Previous CCUS funding initiatives include the Federal Government’s Energy Innovation Program,

³⁰⁷ Finance Canada, “Draft CCUS ICT Legislation”, *supra* note 298 at 32.

³⁰⁸ Department of Finance Canada, “Legislative Proposals Relating to Income Tax and Other Legislation” (9 August 2022) at 27, online (pdf): <<https://fin.canada.ca/drlég-apl/2022/ita-lir-0822-l-2-eng.pdf>>.

³⁰⁹ Innovation, Science and Economic Development Canada, “Strategic Innovation Fund” (12 May 2023), online: *Strategic Innovation Fund* <<https://ised-isde.canada.ca/site/strategic-innovation-fund/en>>.

³¹⁰ Innovation, Science and Economic Development Canada, “Current investment priorities: Strategic Innovation Fund” (12 May 2023), online: *Strategic Innovation Fund* <<https://ised-isde.canada.ca/site/strategic-innovation-fund/en/investments/current-investment-priorities/high-emitting-sectors>>.

which included a research and development call for CCUS technologies to invest up to \$319 million.³¹¹

In 2022, the Government of Canada announced the upcoming creation of the \$15 billion Canada Growth Fund (“**CGF**”) for the purposes of investing in the commercialization and deployment of emissions-reduction technologies and mitigating some of the risks faced by private investment in these sectors.³¹² The mandate of the CGF includes “accelerat[ing] the deployment of key technologies, such as low-carbon hydrogen and carbon capture, utilization and storage”.³¹³ While the full details of the CGF’s program have not yet been announced, it is expected that the CGF will employ a range of investment instruments, including equity, debt, contracts for difference and offtake contracts in order to complement existing Federal initiatives aimed at fostering the development of emissions reduction technologies and projects.³¹⁴ The CGF program, and the use of contracts for difference, could serve to manage the risk that future Federal governments may implement changes in carbon pricing and policy that would be detrimental to a party’s investment in an emissions reduction project. Since it is the Federal Government setting carbon pricing and policies, not industry, this type of contract for difference may help to create price-certainty for project proponents considering large investments in emissions reductions projects, such as CCUS, by allocating policy and pricing risks back to the government through the CGF.³¹⁵ However, it is uncertain the full effect or potential that the CGF may have on CCUS projects.

2. Alberta

The Government of Alberta also offers funding opportunities for CCUS developments within the Province. Many of these opportunities are funded through the *TIER Regulation*, as discussed below. In addition to the *TIER Regulation*, the 2023 Alberta budget (“**Alberta Budget 2023**”)

³¹¹ Natural Resources Canada, “Energy Innovation Program – Carbon Capture, Utilization and Storage RD&D Call” (9 May 2023), online: *Energy Innovation Program* <<https://natural-resources.canada.ca/science-and-data/funding-partnerships/funding-opportunities/funding-grants-incentives/energy-innovation-program/energy-innovation-program-carbon-capture-utilization-and-storage-stream/23815>> [Department of Finance, “Energy Innovation Program”].

³¹² Department of Finance Canada, “Canada Growth Fund Technical Backgrounder” (2022) at 2, online (pdf): <<https://cdev.gc.ca/wp-content/uploads/2022/12/Technical-Backgrounder.pdf>>.

³¹³ Government of Canada, “Fall Economic Statement, 2022”, (2022) at 29, online (pdf): <<https://www.budget.canada.ca/fes-eea/2022/report-rapport/FES-EEA-2022-en.pdf>>.

³¹⁴ Department of Finance, “Energy Innovation Program”, *supra* note 311 at 7.

³¹⁵ Dale Beugin & Blake Shaffer, “The Climate Policy Certainty Gap and How to Fill It” (4 June 2021), online (pdf): *The C.D. Howe Institute*: <https://www.cdhowe.org/sites/default/files/IM-Buegin%20and%20Shaffer_2021-0603_0.pdf>.

announced increased commitments to the Alberta Petrochemical Incentive Program (“**APIP**”) that may be applied to CCUS developments.

(a) TIER Fund

As described in Part E of this paper, Alberta’s *TIER Regulation* stipulates emissions compliance options for regulated industries in the Province. Industry participants regulated by TIER have the option to pay into a fund (the “**TIER Fund**”) if they do not meet emissions reduction targets nor use emissions reduction credits.³¹⁶ Alberta Budget 2023 provides that the first \$100 million in annual revenue plus 50 per cent of the remaining revenue paid into the TIER Fund support emission-reduction initiatives.³¹⁷

Historically, the TIER Fund has been used to fund Alberta’s Industrial Energy Efficiency and Carbon Capture Utilization and Storage Grant Program, which provided a total of \$100 million in funding across seven CCUS projects, announced in November 2021.³¹⁸

Presently, Alberta Budget 2023 provides that \$733 million over three years will be put towards “Innovation and Technology and Carbon Capture and Storage Projects.”³¹⁹ According to Alberta Budget 2023, the TIER Fund will continue to be used to fund programs offered by key partners, including ERA and Alberta Innovates. The CCUS incentives provided by these key partners are summarized below.³²⁰

(i) *Emissions Reduction Alberta – Carbon Capture Kickstart*

Funding from the TIER Fund has been applied to the ERA “Carbon Capture Kickstart” program. In July 2022, ERA and the Government of Alberta announced eleven funding recipients for the Carbon Capture Kickstart program, collectively receiving \$40 million from the TIER Fund to develop their CCUS projects.³²¹

³¹⁶ Government of Alberta, “Fiscal Plan: Securing Alberta’s Future 2023-26” (28 February 2023) at 97 [**Alberta Budget 2023**].

³¹⁷ *Ibid* at 97.

³¹⁸ Government of Alberta, “Carbon capture, utilization and storage – Development and innovation”, online: *Carbon capture utilization and storage* <<https://www.alberta.ca/carbon-capture-utilization-and-storage-development-and-innovation.aspx#:~:text=The%20%24131%2Dmillion%20Industrial%20Energy,contribute%20to%20Alberta's%20economic%20recovery>> [**Government of Alberta, “Development and Innovation”**].

³¹⁹ Alberta Budget 2023, *supra* note 316 at 97.

³²⁰ *Ibid* at 97.

³²¹ Emissions Reduction Alberta, *supra* note 169.

The projects selected for funding represent diverse industrial sectors, including power generation, cement, fertilizer, forest products, and oil and gas, at large emitter sites across Alberta. All funded projects plan to be up and running by 2030.³²²

(ii) *Alberta Innovates – Clean Technology Program*

Through the TIER Fund, Alberta Innovates has provided \$53 million in funding opportunities, including supporting 43 CCUS-related projects.³²³ Alberta Innovates, through its Clean Technology funding program, provides support to researchers, innovators, small and medium-sized enterprises and large companies seeking to advance CCUS technology development from Technology Readiness Levels 3 to 7.³²⁴ Funding from Alberta Innovates is awarded on the “basis of technological innovation, environmental improvement potential, social and economic impacts and potential for deployment in Alberta.”³²⁵

(b) Alberta Petrochemical Incentive Program

The APIP provides grants to petrochemical facilities to encourage private sector investment in certain types of new or expanded Alberta-based petrochemical manufacturing facilities to produce value-added, petrochemical, hydrogen, fertilizer and fuel products. The APIP Program Guidelines provide that carbon capture projects associated with “standalone hydrogen projects and projects that produce fuels from natural gas and natural gas liquids” that capture the CO₂ by-product generated from the production process are eligible to apply for funding.³²⁶

Furthermore, Alberta Budget 2023 expressly states that APIP may be expanded to include funding from the TIER Fund reserved for future carbon capture and storage projects.³²⁷ However, given the early stages, it is uncertain what this funding will look like and how it will specifically apply to carbon capture and storage projects.

³²² *Ibid.*

³²³ Government of Alberta, “Development and Innovation”, *supra* note 318.

³²⁴ Alberta Innovates, “Carbon Capture, Utilization and Sequestration and Hydrogen” (April 2022), online (pdf): *Alberta Innovates*, <https://albertainnovates.ca/app/uploads/2022/06/AI-CCUS-WHITE-PAPER_2022_WEB.pdf>.

³²⁵ David Butler, “Review of Carbon Capture Projects Funded by Alberta Innovates and Related Entities with Recommendations” (1 February 2022) at s 2.3 <<https://albertainnovates.ca/app/uploads/2022/07/CCUS-paper-carbon-capture-Butler.pdf>>.

³²⁶ Alberta Energy, “The Alberta Petrochemicals Incentive Program: Program Guidelines Document” (16 November 2022) at 7, online (pdf): <<https://open.alberta.ca/dataset/ba855f49-bb70-470a-8d9e-6c850eec5c5a/resource/fcb00a82-bd96-437e-ad63-65931ca6a785/download/enr-alberta-petrochemicals-incentive-program-program-guideline-document-2022.pdf>>

³²⁷ Alberta Budget 2023, *supra* note 316 at 107.

In addition to the above initiatives, Alberta Budget 2023 has committed a further \$246 million over 3 years for the “Carbon Capture and Storage Initiative”, but no further details on how this initiative will work have been released so far.³²⁸

3. Other Provinces

Funding opportunities in other provinces are less developed than in Alberta and at the Federal level, however, both British Columbia and Saskatchewan do have some provisions applicable to CCUS. For example, British Columbia developed the CleanBC Industry Fund for the purposes of investing the province’s carbon tax revenues to support projects and innovations in emissions reductions.³²⁹ The program announced investment in 26 new projects in 2022, and while it does not include large scale funding for CCUS projects, it does include \$2.14 million in funding for feasibility studies, including several related to implementing CCUS technologies at existing natural gas plants and proposed conversions to blue hydrogen plants.³³⁰

Saskatchewan has taken a different approach than British Columbia and Alberta and, rather than develop funding programs for the development to technologies such as CCUS, they have, as discussed above in Part C, incorporated CO₂ pipeline projects into the province’s *OIIP*. For qualified projects, the *OIIP* provides up to twenty (20%) percent of eligible project costs as a transferrable tax credit on oil and gas royalties and/or freehold production.³³¹ CO₂ pipeline projects may be eligible for the *OIIP* if the project:

- (a) directly increases oil or carbon dioxide pipeline capacity in Saskatchewan;
- (b) is not considered to be redundant service;
- (c) has not become operational, as determined by the minister, before the eligible project application is submitted; and
- (d) involves a minimum investment of \$10 million in eligible costs.³³²

³²⁸ *Ibid* at 109.

³²⁹ Government of British Columbia, “B.C. invests in cleaner, more innovative industry” (14 September 2022), online: *Environment and Climate Change Strategy* <<https://news.gov.bc.ca/releases/2022ENV0059-001377#:~:text=The%20CleanBC%20Industry%20Fund%20is,and%20advance%20future%20emissions%20redactions>>.

³³⁰ Government of British Columbia, “Funded Projects” (13 March 2023), online: *CleanBC Industry Fund* <<https://www2.gov.bc.ca/gov/content/environment/climate-change/industry/cleanbc-industry-fund/funded-projects>>.

³³¹ *OIIP Regulation*, *supra* note 37.

³³² *Ibid*, s 4.

Proponents under the *OIIIP* are not able to apply for any eligible costs until the project has commenced operation and the proponent has incurred eligible costs of at least \$10 million.³³³

Overall, both the Federal Government and the Government of Alberta have made significant investments in recent years in order to incentivize and stimulate the development of the CCUS industry as a key component of their climate mitigation plans. It remains to be seen, however, what effect these programs will have on the development of the CCUS industry, particularly in light of competitive pressures from the United States and the incentives for CCUS and other energy transition industries implemented through their *Inflation Reduction Act*.³³⁴

I. CONCLUSION

Canada is well positioned from a policy and regulatory perspective to develop CCUS at scale due to its ongoing emissions reduction mandates, set carbon price, mature trading market and provincial and federal fiscal incentives. In addition, Alberta is particularly advantaged with its existing CCUS regulatory regime and available pore space as well as the Quest Project's operating data that informs industry and provides a blueprint for MMV and other key CCUS operational challenges. However, the CCUS industry is changing from one project to multiple hubs and will have to be developed in a way that manages simultaneous challenges and dilemmas including:

- (i) management of potential technical risks such as pressure regimes and seismicity;
- (ii) linked to technical risk, continued public outreach to canvas local opinion on CCUS development so that stakeholders can listen to and address concerns, where feasible;
- (iii) leveraging existing regulatory expertise to mitigate commercial risk arising from market uncertainty, creditworthiness of proponents, duplication of infrastructure, stranded assets, and other key risks that are familiar in the oil and gas industry;
- (iv) enhancing investment by clarifying conditions of maintenance and renewal of sequestration lease agreements as well as favouring existing processes for dispute resolution over ministerial discretion; and

³³³ *Ibid*, s 7(5).

³³⁴ *Inflation Reduction Act of 2022*, United States, 117th Congress Public Law 117-169.

- (v) enabling the existing mature credit trading platform to buy and sell Credits, incorporating carbon tax prices, as adjusted by free market balancing supply and demand pressures.

We have seen a great deal of progress in the industry in a relatively short period of time, however, to truly capitalize on this opportunity, the industry is, and will continue to look for certainty in the applicable regulatory framework and the necessary incentives and financing arrangements to ensure viable development and a competitive landscape. Overall we see a huge opportunity for Alberta to lead the way in CCUS within Canada and globally, with the potential to make a meaningful contribution to Canada's emissions reduction targets. This paper has addressed how far we have come thus far to pave the way for CCUS in Canada, but there remains uncertainty that will continue to need to be addressed by industry, the government and all stakeholders to ensure CCUS is a pillar in Canada's decarbonization picture.